

# **ROD AMENDMENT**

**Gallaway Pits Site  
TND980728992**

**Gallaway  
Fayette County, Tennessee**

**September 2014**

**Prepared By:  
United States Environmental Protection Agency  
Region 4  
Atlanta, Georgia**



**10985658**

Gallaway Pits Site Rod Amendment

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## Gallaway Pits Site Rod Amendment

### **1.0 INTRODUCTION & STATEMENT OF PURPOSE**

#### SITE NAME AND LOCATION

Gallaway Pits Superfund Site  
Gallaway, Tennessee

#### IDENTIFICATION OF LEAD AGENCIES AND SUPPORT AGENCIES

Lead: U.S. Environmental Protection Agency (EPA)  
Support: Tennessee Department of Environment and Conservation

#### CERCLA SECTION 117(c) AND NCP SECTION 300.435(c)(2)(ii)

This amendment to the Record of Decision (ROD) is prepared in fulfillment of the EPA's public participation responsibilities under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also called "Superfund"), 42 U.S.C. § 9617(c). Section 117(c) provides that after issuing a remedial action plan, if any remedial action, enforcement action, settlement or consent decree under Section 106 or Section 122 of CERCLA (42 U.S.C. §§ 9606 or 9622) is entered into, and if such action, settlement, or decree differs in any significant respects from the final plan, the lead agency shall publish an explanation of significant differences and the reasons such changes were made. The EPA is the lead agency at this Site.

Moreover, pursuant to the NCP, EPA is required to Issue a ROD Amendment when, the remedy is fundamentally altered with respect to scope, performance, or cost (40 C.F.R. § 300.435(c)(2)(ii)).

This document presents only a summary of the available information regarding the Gallaway Pits Superfund Site ("the Site). Complete information and the documents which form the basis for EPA's response and this Rod Amendment are located in the Administrative Record for the Site. Pursuant to the requirements of the NCP (40 C.F.R. §300.825(a)(2), this ROD Amendment (and the documents which form the basis for the ROD Amendment) will become part of the Administrative Record for the Site.

#### DATE OF ORIGINAL ROD SIGNATURE

The ROD for the Site was signed on September 26, 1986.

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### SUMMARY OF CIRCUMSTANCES THAT LED TO THE NEED FOR A ROD AMENDMENT

The Site was originally used for sand and gravel mining, resulting in water-filled pits up to 50 feet deep. Some of the pits were used for disposal of liquid and solid waste (mainly pesticide or pesticide residues) and drums. Due to the threat to groundwater posed by the pesticides, EPA initiated an emergency removal action in October 1983. A final remedy was selected in 1984. The final remedy consisted of: removal and treatment of the pond water prior to discharge to a nearby tributary; removal, stabilization, and consolidation of the pond sediment waste into one pond; installation of a cap over the consolidated waste; and groundwater monitoring to ensure that the waste left in place was not leaching into the groundwater. The remedy was completed in 1987. The State of Tennessee assumed responsibility for the operation and maintenance of the cap and groundwater monitoring system in December 1987.

In July 1997, without notification to EPA, the Tennessee Department of Environment and Conservation (TDEC) removed the cap, excavated, transported, and disposed of the waste beneath the cap at an offsite facility, and abandoned the eight ground monitoring wells. The purpose of this ROD Amendment is to document the change in remedy and demonstrate that the Site no longer poses any threat to human health or the environment.

### ADMINISTRATIVE RECORD FILE

This document is an EPA ROD Amendment for the Site. The ROD Amendment will become part of the Administrative Record File as required by the NCP (40 C.F.R. § 300.825(a)(2)). The Administrative Record File is located at the Sam T. Wilson Public Library, 11968 Walker Street Arlington, TN 38002.

### 2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The Galloway Pits Site was extensively mined for sand and gravel, leaving many water-filled pits. The pits were used for the disposal of liquid and solid waste, primarily pesticides and pesticide residue, glass bottles containing quality control samples, and drums. The Site was discovered in January 1982 and proposed to the National Priorities List (NPL) in December 1982. The Site was finalized on the NPL in early 1983.

In October 1983, EPA conducted an Emergency Removal consisting of the excavation and offsite disposal of contaminated sludges and the onsite treatment of water in the pond. The treatment consisted of carbon filtration followed by discharge to two of the smaller ponds onsite. In February 1984, EPA committed funds necessary to conduct a Remedial Investigation/Feasibility Study (RI/FS).

## Gallaway Pits Site Rod Amendment

The RI was finalized in April 1986. The RI included a sampling program for surface water, Sediments, soils, and groundwater. Contaminants detected in the surface water include chlordane, toxaphene, cadmium, and arsenic. Contaminants detected in the sediments and soils include chlordane, cadmium, and arsenic. Groundwater samples were taken at 5 foot intervals to a depth of 52 feet. No pesticides were detected in the subsurface soils samples. Although volatiles and cadmium were detected at the deepest subsurface sample, the RI concluded that groundwater appeared free of contaminants and presented no risk to offsite receptors. No site related contaminants were detected in offsite drinking water. A risk assessment indicated that the only unacceptable risk presented by the site was the potential risk to offsite biota if the ponds were to overflow to offsite tributaries.

As part of the remedial process, the Agency for Toxic Substances and Disease Registry (ATSDR) was asked to review the site data and provide comments on the health risk posed by the site as well as the remedial alternatives proposed for consideration. The ATSDR report, dated June 16, 1986, concurred with the findings in the RI that the potential human health exposure threats does not pose an unacceptable risk. According to the ROD, the basis for the 1987 remedial action was the potential threat to aquatic receptors should the ponds over flow and wash contaminated pond water and sediments into a nearby tributary, not the potential threat to groundwater.

The FS was finalized in June 1986. The FS set out a range of remedial alternatives intended to mitigate any unacceptable risks to receptors posed by onsite ponds and the areas of known soil contamination based on the data contained in the RI report. The FS then compared and contrasted, using the regulatory criteria in effect at that time, how effective each remedy would be in achieving the cleanup goals, how easily each remedy could be implemented, and how much each remedy cost. The total remedy cost used for comparison included the capital costs of construction plus the present day worth of operation and maintenance costs projected out over 30 years.

Based on the RI/FS and after consideration of public comment period, EPA selected the remedy that consisted of the following:

- Removal and treatment of the pond water to state standards using activated carbon. The treated water was then discharged to a nearby tributary of Cane Creek.
- Excavation of pond sediments, stabilization of the sediments with fly ash, and consolidating the stabilized sediments in one of the de-watered ponds.
- Construction of a Resource Conservation and Recovery Act (RCRA) Subtitle C cap over the consolidated sediments.
- Installation of groundwater monitoring wells to ensure that the consolidated sediments did not leach contaminants to groundwater.

## Galloway Pits Site Rod Amendment

- Implementation of institutional controls which consisted of installation of a fence around the capped area.
- Operation and maintenance.

Construction of the remedy was completed in October 1987. The State of Tennessee agreed to assume responsibility for the operation and maintenance of the cap and groundwater monitoring system in December 1987.

EPA conducted its Operational and Functional Determination of the remedy from April 1990 through July 1990 to determine whether the remedy was functioning properly and performing as designed. These activities included groundwater sampling and determining the operation and maintenance requirements of the remedy.

In September 1993, EPA conducted its first Five Year Review of the remedy, the results of which are summarized in a report dated October 4, 1993. The review consisted of visual inspection of the RCRA cap and related drainage features and review of the groundwater monitoring data. The only pesticide detected in groundwater over four years of sampling was heptachlor which occurred in only one sampling event in only one monitoring well and was below the Maximum Contaminant Levels (MCL) published at 40 C.F.R. § 141.62 for that constituent. Three volatile organics were detected in different monitoring wells (2-methylphenol was detected once, chloroform, was detected once, and phenol was detected twice) but their concentrations were below required quantification limits and therefore were of no concern. The only constituents in concentrations above their respective MCLs were nickel and chromium. Since the waste disposed of in the landfill consisted mainly of pesticide waste, the presence of these contaminants was not attributed to the site. The report concluded that these contaminants may naturally occur at high concentrations at the site or that contaminants were attributable to an upgradient source. The site conditions were regarded as good in that the remedy itself remained effective but the report recommended maintenance or repair of several features including the groundwater monitoring well pads, erosion of gullies, and uncontrolled growth both within and outside the perimeter fence which, if left unchecked, could impact the integrity of the RCRA cap.

The next Five Year Review occurred in September 2000 and was documented in a report dated September 28, 2000. The results of this review concluded that no further Five Year Reviews were necessary because the waste and the remedy constructed to address the risk posed by the waste had been removed.

Without prior notice to EPA, TDEC had excavated and disposed of offsite the RCRA cap and the waste beneath the cap, abandoned the groundwater monitoring wells, and regraded the site.

### **3.0 BASIS FOR DOCUMENT**

Pursuant to 40 C.F.R. § 300.435(c)(2)(ii), if the remedial action taken after adoption of the ROD

## Galloway Pits Site Rod Amendment

fundamentally changes the basic features of the selected remedy with respect to scope, performance, and costs, EPA is required to issue a ROD Amendment. TDEC's 1997 remedial action fundamentally changed the scope, performance, and cost of the original 1987 remedy. TDEC's removal of the RCRA cap and underlying waste constitutes a change in scope. Because all of the wastes have been removed, there is no need for the RCRA cap or fencing installed to protect the RCRA cap, the groundwater monitoring wells installed to monitor cap performance, or operation and maintenance costs to maintain these elements of the remedy. This ROD amendment documents that since the waste on site was removed by the action taken by TDEC the site no longer poses an unacceptable risk, and therefore CERCLA action is not warranted.

### 4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

The 1983 Emergency Removal Action consisted of the onsite treatment of the pond water by carbon filtration and discharge to two of the smaller ponds onsite and excavation and offsite disposal of contaminated sludge's remaining in the pond after dewatering.

The Remedial Action implemented by EPA in 1987 consisted of the following:

- Removal and treatment of the pond water to state standards using activated carbon. The treated water was then discharged to a nearby tributary of Cane Creek.
- Excavation of pond sediments, stabilization of the sediments with fly ash, and consolidating the stabilized sediments in one of the de-watered ponds.
- Construction of a Resource Conservation and Recovery Act (RCRA) Subtitle C cap over the consolidated sediments.
- Installation of groundwater monitoring wells to ensure that the consolidated sediments did not leach contaminants to groundwater.
- Implementation of institutional controls which consisted of installation of a fence around the capped area.
- Operation and maintenance.

The remedial action objectives at the time of the 1987 ROD were to eliminate the contaminated pond water which exceeded state standards and to ensure that the remaining pond sediments did not recontaminate future surface water by contaminant diffusion. The remedy installed met these objectives.

The action implemented by TDEC in 1997 consisted of the following:

- Removal of the fence and RCRA cap.
- Excavation of the consolidated soils and sediments lying beneath the cap.
- Disposal of approximately 12 tons of contaminated soils and sediments at the BFI-North Shelby Landfill, a RCRA Subtitle D landfill.
- Confirmatory sampling of the soils remaining in the bottom and sides of the excavation

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analyzing the samples for TCLP pesticides/herbicides. All samples were below detection limits.

- Closure and abandonment of the groundwater monitoring wells.
- Regrading and seeding the site.

TDEC did not take any groundwater samples before abandoning the groundwater monitoring wells and gives no reason for this omission. However, since the groundwater sampling over previous years did not show any pesticide contamination above MCLs, the decision to forgo groundwater sampling is justifiable for a number of reasons:

- 1) No groundwater contamination was found in any of the nearby groundwater wells prior to the initiation of EPA's 1987 CERCLA remedial action;
- 2) No groundwater contamination was found onsite prior to the initiation of EPA's 1987 CERCLA remedial action;
- 3) According to the ROD, the basis for the 1987 remedial action was the potential threat to aquatic receptors should the ponds over flow and wash contaminated pond water and sediments into a nearby tributary, not the potential threat to groundwater.
- 4) The onsite groundwater monitoring wells were installed to determine whether contaminants were leaching from the waste beneath the cap, not to monitor groundwater contamination because there was no evidence that groundwater had been contaminated by the conditions onsite.
- 5) As a class, pesticides have low mobility so it is unlikely that any pesticide contamination remaining in the consolidated soils and sediments beneath the RCRA cap would migrate beyond the confines of the landfill.
- 6) Finally, since the waste was removed by TDEC in 1997, there is no longer a potential source of material that would leach to groundwater.

Appendix A-D provides historical data from previous sampling events that support the above statements.

## 5.0 EVALUATION OF ALTERNATIVES

The NCP requires that the decision document, in this case the ROD Amendment, explain how the nine criteria described at 40 C.F.R. § 300.430(e)(9)(iii) was used to select a remedy, then evaluating the relative performance of each alternative with respect to the nine criteria so that the advantages and disadvantages are clearly understood.

Any risk remaining after implementation of the 1987 remedy was eliminated when TDEC removed all of the contaminated soils and sediment consolidated beneath the RCRA cap in 1997. Due to the removal of the cap and all solidified material, the site in its current condition does not present a risk to human health or the environment.

Therefore, no action under CERCLA is warranted, and remedy development or remedial alternative comparison using the nine criteria is not required.

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**6.0 SUPPORT AGENCY COMMENTS**

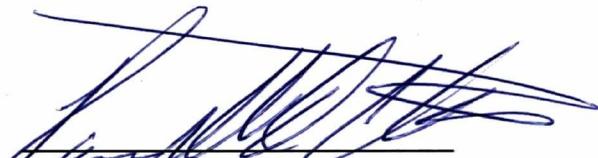
Tennessee Department of Environment and Conservation (TDEC) was the support agency at the time the CERCLA remedy was constructed in 1987. Correspondence dated March 13, 2000, provided the EPA with a Remedial Action Report for the site. TDEC recommended that the site be considered for archival from the CERCLIS listing, since no contamination remained on site.

**7.0 NO FURTHER ACTION**

Based on information currently available and presented above, the site does not pose unacceptable risk and therefore, no further action under CERLCA is warranted.

**8.0 PUBLIC PARTICIPATION**

The EPA is required to issue a ROD Amendment if the remedial action taken after adoption of the ROD fundamentally changes the basic features of the selected remedy with respect to scope, performance, and costs. The U.S. EPA accepted written comments on the Proposed Plan during the public comment period. The responsiveness summary attached in appendix F addresses comments received.

  
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Randall Chaffins, Acting Director  
Superfund Division

9/30/14  
Date

**APPENDIX A**

**Record of Decision – September 26, 1986**

**EPA/ROD/R04-86/013  
1986**

**EPA Superfund  
Record of Decision:**

**GALLAWAY PITS  
EPA ID: TND980728992  
OU 01  
GALLAWAY, TN  
09/26/1986**

RECORD OF DECISION  
REMEDIAL ALTERNATIVE SELECTION

SITE

Galloway Ponds site, Galloway, Tennessee

DOCUMENTS REVIEWED

I am basing my decision primarily on the following documents describing site specific conditions and the analysis of cost-effectiveness of remedial alternatives for the Galloway Ponds site:

- S Galloway Ponds Remedial Action Master Plan
- S Galloway Ponds Focused Remedial Investigation
- S Galloway Ponds Focused Feasibility
- S Study Formal Review by the Agency for Toxic Substances and Disease Registry
- S Galloway Ponds Hazardous Waste Site Clean-up Report
- S Staff Recommendations

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy includes:

- S Excavation of contaminated sediments from Ponds 2 and 5 with onsite disposal in Pond 1.
- S Proper site closure under Subtitle C of RCRA.
- S Dilution of water from Ponds 1, 2, and 5 with city water to meet Ambient Water Quality Criteria and subsequent discharge to unnamed tributary.
- S Institutional controls, which will be fully identified during remedial design, will be implemented. These controls may include, but will not be limited to:
  - S fencing the remediated Pond 1 area,
  - S instituting a mining restriction on the remediated Pond 1 area,
  - S ensuring future land uses compatible with the remedy
- S Operation and Maintenance (O&M) activities will include:
  - S groundwater monitoring
  - S inspection and maintenance of the cap

Additional O&M activities may be identified during the Remedial Design.



RECORD OF DECISION  
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION  
GALLAWAY PONDS SITE  
GALLAWAY, TENNESSEE

SITE LOCATION AND DESCRIPTION

The Gallaway Ponds site is located 2.3 miles northeast of Gallaway, Tennessee, in Fayette County. The site lies near the top of a low ridge composed mainly of gravel, sand, and clay terrace deposits. The ridge has been extensively mined for sand and gravel, producing a landscape dotted with water-filled pits up to 50 feet deep. Some of these pits have been used for the disposal of residential trash, demolition debris, and appliances.

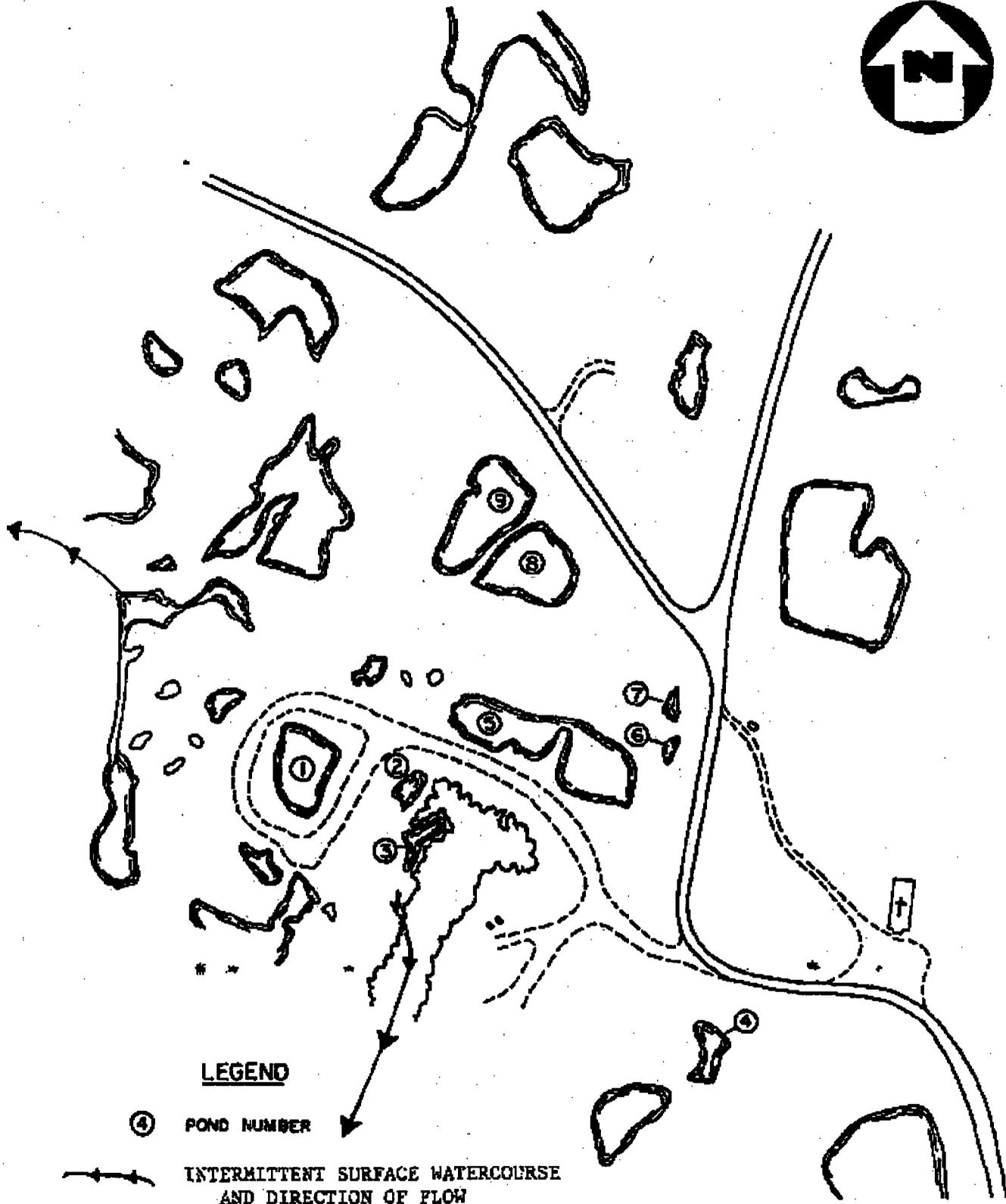
The site as defined by the Remedial Investigation encompasses the land area adjacent to and including nine ponds located within a currently inactive (5 acres) portion of a larger (50 acres) active sand and gravel operation. One pond designated as Pond 1 was used for the disposal of liquid and solid waste (mainly pesticide or pesticide residues), glass jars containing solid waste, and drums (see Figure 1).

Land usage within about one mile of the site is mainly agricultural. Of three properties adjacent to the site, two are now or were recently used for gravel mining operations similar to those carried on at the site. The remainder of the land not used for agricultural or mining purposes is wooded.

The nearest surface water, with the exception of abandoned gravel pits that contain standing water, is an unnamed tributary of Cane Creek. Cane Creek drains southward to the Loosahatchie River. Runoff from the site is largely contained within the property and infiltrates to the water table, rather than discharging to surface waterways (see Figure 2).

The formations significant to the hydrogeology of the site are the Jackson Formation and the overlying water-bearing deposits. The Jackson Formation, which is roughly 90 feet in thickness, is important because it hydraulically separates the water-table aquifer, which produces only small domestic supplies, from the underlying, confined sands of the Claiborne group, which is a major municipal water source (see Figure 3).

ased on available information, the nearest active private water supply wells are located about 1,600 feet west of the site. All of the well logs examined indicated that these wells are screened in the water-bearing sand zone which underlies the Jackson clay. Municipal wells located about 2 miles to the southwest of the site supply water to the town of Gallaway. The church, located adjacent to the site, is supplied with water from the Gallaway municipal water system.



**LEGEND**

④ POND NUMBER

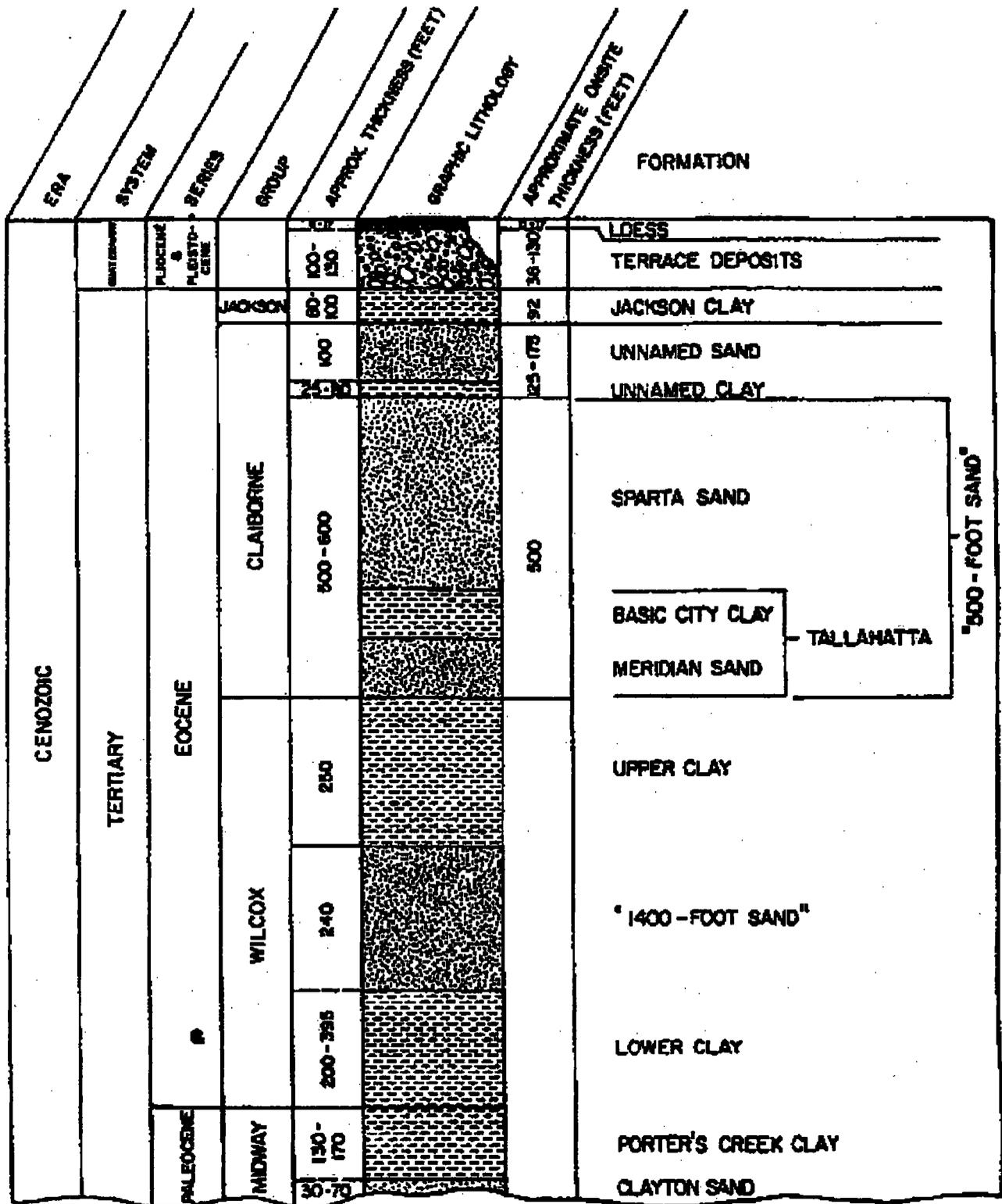
INTERMITTENT SURFACE WATERCOURSE  
AND DIRECTION OF FLOW

**POND LOCATIONS**  
**GALLAWAY PONDS SITE, GALLAWAY, TN**

SCALE : 1" = 200'

**FIGURE 1**





(FROM MOORE, 1965; CRINER, SJN, AND NYMAN, 1968)

FIGURE 3

**PARTIAL GEOLOGIC COLUMN, GALLAWAY, TN, AREA**  
**GALLAWAY PONDS SITE, GALLAWAY, TN**

NOT TO SCALE

## SITE HISTORY

Disposal of hazardous materials at the site occurred for an undetermined period of time, probably in the 1970's or early 1980's. Drums containing liquid waste were disposed of by emptying the drum into a small pond or by placing the entire drum into the pond. Also, small glass bottles containing "quality control" samples from pesticide blending operations were disposed of directly to the small pond. No disposal activities at this site have ever been permitted by State or local authorities.

In January 1982, the Tennessee Division of Solid Waste Management (TDSWM) received a report from a citizen concerning the dumping of drums and smaller containers into a gravel pit near Gallaway, TN. This person also indicated that there was a strong odor of pesticides in the area. TDSWM personnel investigated the incident and noticed that labels on some of the containers made reference to Arlington Blending and Packaging Company (ABPC), a small pesticide blending company located in Arlington, TN.

TDSWM's inspection of the site revealed that some of the containers had been removed from the pond. They later learned that the owner of ABPC had conducted the removal. During this inspection TDSWM personnel collected water and sediment samples from the pit for analysis. The analytical results showed elevated levels of pesticides.

The Gallaway Ponds site was proposed for the National Priorities List (NPL) in December 1982, and was finalized in early 1983 with a MITRE score of 30.77. In October 1983, the EPA conducted an emergency cleanup of Pond 1, consisting of the excavation and offsite disposal of contaminated sludges and the onsite treatment of the water in the pond. The treatment process involved the carbon filtration of the pond water to limits established by the Tennessee Department of Health and Environment (TDHE), Division of Water Quality Control. The treated water was subsequently discharged to ponds 2 and 3, located east of Pond 1. In February 1984, EPA obligated funds to conduct a Remedial Investigation/Feasibility Study (RI/FS).

NUS Corporation was tasked to perform the RI/FS. Based on extensive discussions with the EPA On-Scene Coordinator for the federal clean-up action and a review of site background data, it was determined that a focused RI would be appropriate for this site.

The Focused Remedial Investigation Report was finalized in April 1986. The draft Focused Feasibility Study was completed in June 1986. The public comment period ended on August 12, 1986.

SITE OWNERSHIP

The site has been used for sand and gravel mining for many years. Mr. Bennie Dove, the former site owner, leased the property for mining operations and had no connection with the waste disposal practices at anytime.

In 1984, Mr. Billy Ray acquired the property. His intended use of the 50-acres was to mine the remaining gravel deposits. He was asked to cease his active mining operations in the site investigation areas to allow for EPA remedial investigation studies. Mr. Ray is currently re-mining gravel deposits in much of the surrounding areas.

## CURRENT SITE STATUS

The Focused Remedial Investigation included a sampling program for the following environmental media: surface water and sediment, surface soils and groundwater. The following sections describe the results of this investigation:

### ONSITE SURFACE WATER/SEDIMENT (Ponds 1-9)

Contaminants detected in the surface waters of Ponds 1, 2, 5, 8, and 9 exceed the acute Ambient Water Quality Criteria (AWQC) for the following parameters (see Table 1): Pond 1 - chlordane, Pond 2 - toxaphene, Pond 5 - cadmium, Pond 8 - arsenic, and Pond 9 - cadmium.

Chronic AWQC limits are exceeded in Ponds 1, 2, 3, 4, 8, and 9 for pesticides and in Ponds 5, 8, and 9 for inorganics. These contaminant levels are high enough to be harmful to aquatic life and probably preclude the presence of many sensitive species in the ponds.

The sediment in Ponds 1, 2, 3, 4, 8, and 9 showed pesticide contamination. Chlordane is the most prevalent contaminant, with a few occurrences of dieldrin and toxaphene. The sediment in Pond 7 contained cadmium above background levels, while ponds 8 and 9 contained high levels of arsenic.

### SURFACE SOILS

Chlordane was detected in the surface soils around the northern half of Pond 1 and between Ponds 1 and 9. Arsenic and cadmium were also detected in the surface soils. Similar levels of arsenic were detected over much of the site, as well as in two background locations, and therefore its presence may not be site-related. Cadmium was detected in a sample located west of Pond 1, which was the same sample that contained the highest chlordane value. Cadmium was also detected in a sample that was located between Ponds 1 and 3 (see Table 2).

### GROUNDWATER

No pesticides were detected in the subsurface soil sample located west of Pond 1. Samples were collected at 5-foot intervals from a depth of 5 feet to a depth of 52 feet. As a class, pesticides have low mobility and therefore, are unlikely to migrate to any great depth. Chloroform, a common laboratory solvent, was estimated to be present at very low levels (less than the contract-required detection limit) in the upper 10 feet of the boring. Other volatiles, which were not found elsewhere on site, were found in the deepest subsurface sample at a depth of 51 feet. This sample was collected from within the top of the Jackson clay. Cadmium was also present in this sample. It is possible that the clay has concentrated the volatiles and cadmium from the groundwater, although these contaminants were not detected in any of the groundwater samples.

TABLE 1

POND SAMPLING DATA COMPARED TO  
 AMBIENT WATER QUALITY CRITERIA  
 GALLAWAY PONDS SITE  
 GALLAWAY, TENNESSEE

Pond	Chlordane		Dieldrin		Toxaphene		Arsenic		Cadmium*	
	AWQC = 2.4/0.0043 µg/l		AWQC = 2.5/0.0019 µg/l		AWQC = 1.6/0.0013 µg/l		AWQC = 140/72 µg/l		AWCC(acute) = 0.73) µg/l - Pond 9 (1.6) µg/l - Pond 5	
	Max. Sed. Conc. (ppb)	Max. SW. Conc. (ppb)	Max. Sed. Conc. (ppb)	Max. SW. Conc. (ppb)						
1	31,000	2.6	-	-	-	-	5,200	(14)	-	-
2	500	(0.07)	-	-	2,900	17	5,400	14	-	-
3	990	(0.13)	-	-	-	-	5,400	12	-	-
4	890	(0.12)	-	-	-	-	19,000	(50)	-	-
5	-	-	-	-	-	-	5,000	(13)	-	5.1
6	-	-	-	-	-	-	6,100	18	-	-
7	-	-	-	-	-	-	7,300	(19)	5.5	-
8	-	1.3	1,400	1.4	280	(1.6)	28,000	200	-	-
9	2,000	0.67	-	0.40	-	-	29,000	49	-	5.3

Notes:

- AWQC - Ambient Water Quality Criteria (USEPA, October 1980 and USEPA, February 1984) - Acute/Chronic
- SW - Surface water
- ppb - Parts per billion (Mg/l)
- ( ) - Calculated value
- S - Not detected in media or not calculated
- \* - AWQC for cadmium is based on hardness

TABLE 2

**FREQUENCY AND OCCURRENCE OF CHEMICAL PARAMETERS  
GALLAWAY POND SITE  
RESULTS OF THE PHASE 1 - FOCUSED REMEDIAL INVESTIGATION  
GALLAWAY, TENNESSEE  
(Results Reported in ppb Unless Indicated Otherwise)**

Chemical Parameter	Surface Water		Sediment		Surface Soil	
	Range of Detections (Low/High)	No. of Detections/ No. of Samples	Range of Detections (Low/High)	No. of Detections/ No. of Samples	Range of Detections (Low/High)	No. of Detections/ No. of Samples
<u>Monocyclic Aromatics</u>						
ethylbenzene						
toluene						
total xylenes						
<u>Halogenated Aliphatics</u>						
1,1,1-trichloroethane						
methylene chloride	380	430		2/15		
chloroform						
<u>Ketones</u>						
acetone			400	2,300	3/13	1/12
2 butanone						
<u>Polynuclear aromatics</u>						
benzo(a)anthracene			--	70	1/13	
<u>Phthalate Esters</u>						
bis(2-ethylhexyl)phthalate						
di-n-octyl phthalate			--	100	1/13	
<u>Pesticides/PCBs</u>						
chlordane	0.67	2.6	4/15	500	14,000	7/13
dieldrin	0.40	1.4	2/15	--	280	2/13
endrin	0.05	0.14	2/15			
endrin ketone	0.11	0.25	2/15			
toxaphene	--	17	1/15	--	2,900	1/13

TABLE 2

**FREQUENCY AND OCCURRENCE OF CHEMICAL PARAMETERS  
GALLAWAY POND SITE  
RESULTS OF THE PHASE 1 - FOCUSED REMEDIAL INVESTIGATION  
GALLAWAY, TENNESSEE  
(Results Reported in ppb Unless Indicated Otherwise)  
PAGE TWO**

Chemical Parameter	Surface Water		No. of Detections/ No. of Samples	Sediment		No. of Detections/ No. of Samples	Surface Soil		No. of Detections/ No. of Samples
	Range of Detections (Low/High)			Range of Detections (Low/High)			Range of Detections (Low/High)		
<b><u>Miscellaneous Compounds</u></b>									
propanol				--	5	1/13			
benzoic acid				--	400	1/13			
hexandioic acid, dioctyl ester				900	3,000	3/13			
prometryne				--	1,000	1/13			
				(mg/kg)			mg/kg)		
<b><u>Inorganics</u></b>									
aluminum	100	20,000	15/15	5,800	15,000	13/13	6,300	24,000	13/13
arsenic	12	200	6/15	5	29	11/13	2.8	30	12/13
barium	30	250	14/15	55	150	13/13	39	130	12/13
beryllium	0.7	1.6	4/15	0.47	1.1	11/13	0.49	0.96	11/13
cadmium	5.1	5.5	3/15	--	5.5	1/13	3.2	4.2	2/13
calcium	2,700	32,000	15/15	800	5,500	13/13	720	40,000	12/13
chromium	4.6	56	10/15	9.9	26	13/13	10	20	13/13
cobalt	13	15	2/15	6	19	13/13	5.8	13	12/13
copper	5.3	80	13/15	9.2	45	13/13	8.7	27	12/13
iron	100	51,000	15/15	12,000	34,000	13/13	13,000	30,000	13/13
lead	3	38	12/15	7.5	56	13/13	6.2	20	13/13
magnesium	1,500	12,000	15/15	1,200	2,900	13/13	660	3,200	12/13
manganese	12	2,800	15/15	180	1,100	13/13	130	740	13/13
mercury				0.2	0.3	7/13	0.2	0.3	2/13
nickel	8.4	280	10/15	6.7	21	13/13	7.9	21	12/13
potassium	1,400	3,600	14/15	1,000	1,400	4/13	750	1,300	7/13
sodium	2,800	11,000	15/15	900	6,000	9/13	3,000	4,000	10/13
vanadium	5.7	86	9/15	18	44	13/13	21	44	13/13
zinc	20	180	12/15	35	170	13/13	20	84	13/13

**TABLE 2**

**FREQUENCY AND OCCURRENCE OF CHEMICAL PARAMETERS  
GALLAWAY POND SITE  
RESULTS OF THE PHASE 1 - FOCUSED REMEDIAL INVESTIGATION  
GALLAWAY, TENNESSEE  
(Results Reported in ppb Unless Indicated Otherwise)  
PAGE THREE**

Chemical Parameter	Surface Soil		Groundwater		Residential Wells	
	Range of Detections (Low/High)	No. of Detections/ No. of Samples	Range of Detections (Low/High)	No. of Detections/ No. of Samples	Range of Detections (Low/High)	No. of Detections/ No. of Samples
<b><u>Monocyclic Aromatics</u></b>						
ethylbenzene	--	21				
toluene	--	40				
total xylenes	--	81				
<b><u>Halogenated Aliphatics</u></b>						
1,1,1-trichloroethane	--	13				
methylene chloride						
chloroform	3.6	4.2	3/11	3.1	3.6	2/8
<b><u>Ketones</u></b>						
acetone						
2 butanone	--	3.8	1/11			
<b><u>Polynuclear aromatics</u></b>						
benzo(a)anthracene						
<b><u>Phthalate Esters</u></b>						
bis(2-ethylhexyl)phthalate	230	310	3/11			
di-n-octyl phthalate						
<b><u>Pesticides/PCBs</u></b>						
chlordane						
dieldrin						
endrin						
endrin ketone						
toxaphene						

**TABLE 2**

**FREQUENCY AND OCCURRENCE OF CHEMICAL PARAMETERS  
GALLAWAY POND SITE  
RESULTS OF THE PHASE 1 - FOCUSED REMEDIAL INVESTIGATION  
GALLAWAY, TENNESSEE  
(Results Reported in ppb Unless Indicated Otherwise)  
PAGE FOUR**

Chemical Parameter	Surface Soil		Groundwater			Residential Wells			
	Range of Detections (Low/High)	No. of Detections/ No. of Samples	Range of Detections (Low/High)	No. of Detections/ No. of Samples	Range of Detections (Low/High)	No. of Detections/ No. of Samples			
<b><u>Miscellaneous Compounds</u></b>									
propanol									
benzoic acid									
hexandioic acid, dioctyl ester									
prometryne									
	(mg/kg)								
<b><u>Inorganics</u></b>									
aluminum	1,200	13,000	11/11	320	1,100	8/8			
arsenic									
barium				--	120	1/8	17	180	3/3
beryllium									
cadmium	--	16	1/11				--	5.0	1/3
calcium				13,000	41,000	8/8	3,800	6,000	3/3
chromium	10	20	4/11	10	23	4/8			
cobalt									
copper				28	140	8/8	--	12	1/3
iron	4,300	19,000	11/11	900	6,500	8/8	--	5,000	1/3
lead	5	17	11/11	5.6	7.4	2/8	2	3	2/3
magnesium				3,300	20,000	7/8	1,700	4,800	3/3
manganese	10	600	8/11	52	370	8/8	--	110	1/3
mercury				--	0.2	1/8			
nickel				94	140	7/8			
potassium				3,300	3,800	2/8	--	2,300	1/3
sodium				21,000	92,000	8/8	14,000	20,000	3/3
vanadium	20	30	4/11						
zinc	20	140	6/11	15	82	8/8	15	21	2/3

Note: Sampling performed by NUS Corporation in January and May 1985.

The groundwater beneath the site currently appears to be free of site-related contaminants and does not appear to present any risk to offsite receptors.

#### OFFSITE

No site-related contaminants were detected in offsite surface waters. One offsite sediment sample, located in a tributary of Cane Creek south of the site, contained chlordane and dieldrin. The presence of pesticides in this sediment sample may be the result of either erosion of onsite soils or the local agricultural application of pesticides. No site-related contaminants were detected in offsite drinking water.

#### HYDROGEOLOGY

Ground Water Characteristics. The water-table gradient is fairly flat across the site, although the depth to the water table surface varies with topography. The depth from the ground surface to the water table in the monitoring wells ranged from approximately 25 feet to 45 feet.

Groundwater generally flows from east to west beneath the site. A groundwater divide may exist on site such that groundwater in the northern half of the site tends to flow to the northwest, whereas groundwater in the southern half of the site tends to flow to the southwest. The groundwater flow direction may be controlled to some extent by discharge into the nearby stream headwaters.

#### TRANSPORT ROUTES

Due to the behavior of these pesticides in soils, they would tend to adsorb to the sediments and remain in-place. Table 3 lists the relative mobilities of several pesticides in soils. The pesticides of interest, chlordane, dieldrin, and toxaphene, are immobile. Aside from the chemical structure of these pesticides, soil properties also influence adsorption. The low permeability of the pond bottoms does not favor infiltration of contaminants into the groundwater. Clay and organic matter content tend to be highly correlated with pesticide adsorption. Soil/sediment adsorption coefficients of the pesticides found on site also indicate that the pesticides are not readily transported in solution to groundwater but, tend to adsorb to soil particles.

The tendency of pesticides to leach from soils is inversely related to their potential for adsorption. Strongly adsorbed molecules are not likely to move downward through the soil profile. Therefore, conditions which encourage such adsorption will discourage leaching.

Therefore, if the contaminated soils were to be transported offsite it, would be via storm water runoff or the wind.

## RECEPTORS

At the present time, no receptors have been identified at the site. Potential receptors at the site include the following:

- Employees of the gravel company who come into contact with the contaminated soil and pond sediments will be exposed to both a dermal and an inhalation condition.
- S** Casual intruders who regularly traverse the site will be exposed to contaminated surface soils.
- S** Local residents who swim in the ponds will experience both very low dermal and (accidental) ingestion exposures to contaminated sediments and surface water. However, the use of the ponds for swimming is expected to be highly infrequent.
- S** Local residents who may regularly consume fish from the ponds would be at a very low risk; however, present site conditions make this repeated, long-term exposure unlikely because fish are not known to be present in any of the ponds.
- S** Local residents who may regularly consume fish from the nearby streams which receive sediments or runoff from the site could, through the food chain, be exposed to contaminants that have migrated from the site.
- S** Offsite biota, in the tributaries that receive runoff of pond water overflow during heavy rainfall, could be adversely affected by site-related contamination.
- S** Persons using driveways constructed with sand and gravel from the pits, where the sand and gravel has not been covered with asphalt. Because of the tendency of this material to "set up" after a rain, exposures will be very limited.

## RISK ASSESSMENT

A quantitative risk assessment was performed for various contaminant exposure pathways. Risks for the exposure pathways were calculated for the site for the conditions of both mining and no-mining. Based on the available data and the risk assessment assumptions, the exposure pathways present no unacceptable risks to human receptors under both the no-mining and mining conditions. The risks for each pathway were all less than  $1 \times 10^{-6}$  to humans. Tables 4 and 5 present summaries of the carcinogenic risks posed by the resumption of mining in the area of the contaminated ponds. The only unacceptable risk presented by the Gallaway Ponds Site is the potential risk to offsite biota that could occur if Ponds 1, 2, and 5 would overflow to offsite tributaries. Table 6 contains ceiling contaminant concentrations (action levels) that could cause biota risks.

TABLE 3

RELATIVE MOBILITY OF PESTICIDES IN SOILS\*

<u>Immobile</u>		<u>Slightly Mobile</u>	<u>Mobile</u>
Aldrin		Atrazine	2,4-D
Chlordane		Simazine	2,4,5-T
DDT		Prometryne	MCPA
Dieldrin		Azinophosmethyl	Picloram
Endrin		Carbophenthion	Fenac
Heptachlor		Diazinon	
Toxaphene		Ethion	
TDE		Methyl parathion	
Lindane	• •	Lindane	
Heptachlor epoxide	• •	Heptachlor epoxide	
Trifluralin		Parathion	
		Phorate	
		Diuron	
		Monuron	
		Linuron	
		CIPC	
		IPC	
		EPTC	
		Pebulate	

\* Pesticide Disposal and Detoxification - Processes and Techniques, 1981.

TABLE 4

**CARCINOGENIC RISKS FROM DERMAL EXPOSURES OF  
MINING COMPANY EMPLOYEES  
GALLAWAY PONDS SITE  
GALLAWAY, TENNESSEE**

Activity	Carcinogenic Risk Due to Exposure			Total Risk
	Chlordane	Dieldrin	Toxaphene	
<b>Soil Disturbance</b>				
- Entire Site	$2.5 \times 10^{-7}$	ND	ND	$2.5 \times 10^{-7}$
<b>Sediment Disturbance</b>				
- Pond 1	$6.8 \times 10^{-7}$	ND	ND	$6.8 \times 10^{-7}$
- Pond 2	$1.1 \times 10^{-8}$	ND	$4.4 \times 10^{-8}$	$5.5 \times 10^{-8}$
- Pond 3	$2.2 \times 10^{-8}$	ND	ND	$2.2 \times 10^{-8}$
- Pond 4	$2.0 \times 10^{-8}$	ND	ND	$2.0 \times 10^{-8}$
- Pond 5	ND	ND	ND	-
- Pond 6	ND	ND	ND	-
- Pond 7	ND	ND		-
- Pond 8	ND	$5.8 \times 10^{-7}$	$4.2 \times 10^{-9}$	$5.8 \times 10^{-7}$
- Pond 9	$4.8 \times 10^{-8}$	ND	ND	$4.8 \times 10^{-8}$
<b>Total Risk</b>				$1.6 \times 10^{-6}$ (1 in 600,000)

Notes: ND - Contaminant was not detected in medium.

TABLE 5

**CARCINOGENIC RISKS FROM INHALATIONAL EXPOSURES OF  
MINING COMPANY EMPLOYEES  
GALLAWAY PONDS SITE  
GALLAWAY, TENNESSEE**

Activity	Carcinogenic Risk Due to Exposure					Total Risk
	Chlordane	Dieldrin	Toxaphene	Arsenic	Cadmium	
<b>Soil Disturbance</b>						
- Entire Site	$1.5 \times 10^{-11}$	ND	ND	$1.1 \times 10^{-9}$	ND	$1.1 \times 10^{-9}$
<b>Sediment Disturbance</b>						
- Pond 1	$3.8 \times 10^{-11}$	ND	ND	$2.6 \times 10^{-11}$	NE	$6.4 \times 10^{-11}$
- Pond 2	$6.0 \times 10^{-13}$	ND	$2.4 \times 10^{-12}$	$6.1 \times 10^{-11}$	ND	$6.4 \times 10^{-11}$
- Pond 3	$1.2 \times 10^{-12}$	ND	ND	$6.2 \times 10^{-11}$	ND	$6.3 \times 10^{-11}$
- Pond 4	$1.2 \times 10^{-12}$	ND	ND	$2.2 \times 10^{-10}$	ND	$2.2 \times 10^{-11}$
- Pond 5	ND	ND	ND	$5.7 \times 10^{-11}$	ND	$5.7 \times 10^{-11}$
- Pond 6	ND	ND	ND	$7.0 \times 10^{-11}$	ND	$7.0 \times 10^{-11}$
- Pond 7	ND	ND	ND	$8.4 \times 10^{-11}$	$1.7 \times 10^{-10}$	$2.5 \times 10^{-10}$
- Pond 8	ND	$3.2 \times 10^{-11}$	$2.4 \times 10^{-13}$	$3.2 \times 10^{-10}$	ND	$3.5 \times 10^{-10}$
- Pond 9	$2.7 \times 10^{-12}$	ND	ND	$4.0 \times 10^{-10}$	ND	$4.0 \times 10^{-10}$
<b>Total Risk</b>						$2.6 \times 10^{-9}$ (1 in $3.8 \times 10^8$ )

Notes: ND - Contaminant was not detected in medium.

TABLE 6

**PRESENT AND FUTURE REMEDIAL ACTION LEVELS (FOR SUSPECTED CARCINOGENS)  
GALLAWAY PONDS SITE  
FOCUSED FEASIBILITY STUDY**

Exposure Pathway and Receptor	Present and Future Remedial Action Objectives	Action Levels - (Units are ug/l for water, ug/kg for soil and sediment)			
		Chlordane	Toxaphene	Arsenic	Cadmium
<b>1. Surface Water, Onsite Ponds</b>					
a. Ingestion -- humans (from swimming)	a. Monitor to ensure that pond water contaminant levels are below $1 \times 10^{-4}$ risk level for swimmers, if this activity occurs.	16,000 ug/l	4,100 ug/l	1,700 ug/l	3,300 ug/l
b. Dermal -- humans (from swimming)	b. Same as a. for pond sediment diffusion into water.	450,000 ug/l	660,000 ug/l	NA	NA
<b>2. Surface Water, Offsite Tributaries</b>					
a. Biota	a. Reduce surface water contaminant levels in Ponds 1, 2, and 5 to acute AWQC plus monitor 3, 4, 6, and 7, and compare values to acute AWQC to detect potential risk to offsite biota.	2.4 ug/l	1.6 ug/l	140 ug/l	Pond 1 - 3.9 ug/l* Pond 2 - 1.1 ug/l Pond 3 - 1.2 ug/l Pond 4 - 0.94 ug/l Pond 5 - 1.6 ug/l Pond 6 - 2.6 ug/l Pond 7 - 0.92 ug/l
	Monitor remaining pond sediments and compare to levels that can diffuse to water above acute AWQC.				
	Monitor offsite tributary water and compare to chronic AWQC values to detect risk to biota.	0.0043 ug/l	0.013 ug/l	72 ug/l	0.3 ug/l

TABLE 6

**PRESENT AND FUTURE REMEDIAL ACTION LEVELS (FOR SUSPECTED CARCINOGENS)  
GALLAWAY PONDS SITE  
FOCUSED FEASIBILITY STUDY  
PAGE TWO**

Exposure Pathway and Receptor	Present and Future Remedial Action Objectives	Action Levels - (Units are ug/l for water, ug/kg for soil and sediment)				
		Chlordane	Toxaphene	Arsenic	Cadmium	Dieldrin
<b>3. Sediments Onsite Ponds</b>						
a. Dermal – swimmers	a. Monitor pond sediments to ensure levels are below $1 \times 10^{-4}$ risk if this activity occurs.	$8.2 \times 10^5$ ug/kg	$1.2 \times 10^7$ ug/kg	NA	NA	
b. Dermal – miners	b. Monitor pond sediments to ensure levels are below $1 \times 10^{-4}$ risk if this activity occurs.	$7.3 \times 10^6$ ug/kg	$6.6 \times 10^6$ ug/kg	NA	NA	
<b>4. Sediments Offsite Tributaries</b>						
a. Offsite biota	a. Monitor tributary sediments to ensure levels will not diffuse into water to levels above chronic AWQC to protect biota.	44,000 ug/kg	170,000 ug/kg	NS	NB	230,000 ug/kg
b. Dermal – humans	b. Monitor tributary sediments to ensure that levels are below $1 \times 10^{-4}$ risk for these receptors.	5,800 ug/kg	8,600 ug/kg	NS	NB	300 ug/kg

TABLE 6

**PRESENT AND FUTURE REMEDIAL ACTION LEVELS (FOR SUSPECTED CARCINOGENS)  
GALLAWAY PONDS SITE  
FOCUSED FEASIBILITY STUDY  
PAGE THREE**

Exposure Pathway and Receptor	Present and Future Remedial Action Objectives	Action Levels - (Units are ug/l for water, ug/kg for soil and sediment)				
		Chlordane	Toxaphene	Arsenic	Cadmium	Dieldrin
<b>5. Soils - Onsite</b>						
a. Dermal -- miners	a. Monitor soil to ensure average site soil contaminant levels are below $1 \times 10^{-4}$ dermal risk level to miners.	300,000 ug/kg	440,000 ug/kg	NA	NA	
b. Dermal -- casual intruders	b. Same as a. for casual intruders.	100,000 ug/kg	150,000 ug/kg	NA	NA	
<b>8. Air (Airborne soil/ sediment particulates)</b>						
a. Inhalation of particulates -- miners	a. Compare average site soil monitoring data and average pond sediment data to calculated soil/ sediment values that can create $> 10^{-4}$ inhalation risk.	Pure	Pure	Pure	Pure	
b. Inhalation of particulates -- casual intruders	b. Compare average site soil monitoring data to calculated soil values that can create a $> 10^{-4}$ inhalation risk.	Pure	Pure	Pure	Pure	

TABLE 6

**PRESENT AND FUTURE REMEDIAL ACTION LEVELS (FOR SUSPECTED CARCINOGENS)  
GALLAWAY PONDS SITE  
FOCUSED FEASIBILITY STUDY  
PAGE FOUR**

Exposure Pathway and Receptor	Present and Future Remedial Action Objectives	Action Levels - (Units are ug/l for water, ug/kg for soil and sediment)				
		Chlordane	Toxaphene	Arsenic	Cadmium	Dieldrin
7. Biota -- Offsite Tributaries						
a. Ingestion -- humans	a. If fish are consumed from offsite tributaries, then predicted fish tissue concentrations should be estimated from tributary water and sediment sampling results in order to ensure a $< 10^{-4}$ risk to persons eating fish.	0.018 ug/l--water  2.9x10 <sup>6</sup> ug/kg--sediment	0.037 ug/l water  490,000 ug/kg--sediment	120 ug/l--water  NS--sediment	NB ug/l--water  NB--sediment	0.006--water  830,000--sediment

Notes:

- NA = Cadmium and arsenic not absorbed dermally
- NB = Does not bioconcentrate
- NS = No solubility data available for arsenic
- \* = AWQC for cadmium, based on water hardness
- Pure = Contaminant concentration has to be nearly pure for  $10^{-4}$  risk

HEALTH ASSESSMENT

As part of the remedial process, the Agency for Toxic Substances and Diseased Registry (ATSDR) was asked to review the site data and provide comments on the health risk posed by the site as well as the remedial alternatives under consideration. Their report dated June 16, 1986 concurred with the findings of the focused RI in that the potential human health exposure threats from the contaminants onsite appear negligible.

ENFORCEMENT ANALYSIS

On September 5, 1985 EPA sent combined notice and demand letters to approximately twelve (12) potentially responsible parties (PRPs), including William Bell the owner/operator of the Arlington Blending and Packaging Company. The letters informed the PRPs of the Agency's belief that they were potentially liable for the costs associated with cleanup activities at the site, included calculations of the cleanup activities at the site, included calculations of the cleanup costs and allowed fifteen (15) days in which PRPs could respond to the Agency's demand for reimbursement of those costs. The letter also encouraged the PRPs to organize in order to facilitate discussions with EPA concerning payment.

The PRPs formed a steering committee, ostensibly, for the purpose of obtaining and reviewing the government's evidentiary materials and the PRPs expressed their desire to cooperated with EPA in determining their respective liability, if any. However, to date the PRPs have not come forward with a settlement offer either individually or collectively.

Based on the PRPs obvious absence of willingness to reach a negotiated settlement, the case was referred to the United States Department of Justice (DOJ) on November 8, 1985. Subsequently, on January 7, 1986, information request letters were sent to the PRPs in order to obtain additional information.

## INITIAL SCREENING OF REMEDIAL TECHNOLOGIES

Section 300.68 (g) of the NCP requires that alternatives developed in this section be subjected to an initial screening to narrow the list of potential remedial actions for further detailed analysis. Criteria used in the initial screening of alternatives are public health, environmental, cost, technical and institutional considerations.

### POND WATER REMEDIATION

Remedial responses developed for the site include processes which would be most applicable for hazardous waste site remediation. Rarely will only one treatment process be sufficient for aqueous waste. Therefore, this section will include information on unit treatment processes which are frequently used in combination and any pre-treatment requirements which are a prerequisite to effective use of each treatment process. Processes which were examined but proved not to be applicable to the site are land treatment, biological treatment, adsorption by oil-absorbing media, chemical oxidation, chemical dechlorination, chemical reduction, liquid-liquid extraction, oil-water separation, steam stripping, air stripping, and ultraviolet/ozonation. The unit treatment processes considered for the site are activated carbon, precipitation and sedimentation, filtration, equalization, ion exchange, reverse osmosis, blending onsite pond water, and dilution with public water.

### SCREENING EVALUATION

Activated carbon is a well-developed technology which is widely used in the treatment of hazardous waste streams. It is especially well suited for removal of mixed organics from aqueous wastes. However, it is not applicable for the removal of cadmium and iron. Therefore, since equalizing (mixing) the water from ponds 1, 2, and 5 would provide the same environmental benefits (i.e. reduction of the likelihood of present or future threat from hazardous substances), this technology was eliminated from further consideration.

Precipitation and sedimentation would be applicable for iron removal, but would probably, be ineffective for cadmium removal. The efficiency of cadmium removal solely on a solubility basis is dependent upon the pH level. The theoretical minimum solubility of cadmium hydroxide is higher than the AWQC limit for cadmium discharge. Therefore, precipitation and sedimentation will be eliminated from further consideration.

Dilution involves pumping pond water to an equalization basin and adding clean water until all AWQC levels are met. The diluted pond water would then be suitable for pumping (discharge) to the local surface water. Any sediment that accumulated in the equalization basin would be handled, along with the sediment in ponds 1, 2, and 5. No other residuals would be generated by using this technique. This technique will be retained for further evaluation.

Unit treatment processes for treating the pond water to AWQC levels would be filtration, equalization, and either ion exchange or reverse osmosis. Filtration is applicable at the site if it is necessary to remove suspended solids prior from any aqueous waste stream that may be generated during the remedial action at the site.

The primary objective of equalization is to dampen flow and concentration fluctuations. Most treatment processes operate more effectively if wastewater composition and flow rate are fairly constant. Equalization basins and tanks can dramatically increase the stability of treatment processes that are sensitive to fluctuating contaminant concentrations.

In this case, sediment that accumulated in the equalization basin would be removed and handled with the sediment from Ponds 1, 2, and 5. There are no other environmental impacts associated with equalization. The only disadvantage is that an equalization basin, when used to dampen fluctuations in the flow rate, may require a considerable amount of land area.

Ion exchange is an aqueous phase process. The dilute, purified stream would be suitable for discharge. However, the concentrated regenerant stream would require proper disposal. This regenerant stream could potentially have high concentrations of the substances removed from the pond water. The regenerant waste could be recycled, but ultimately it would be disposed as a hazardous waste. The regenerant waste stream could be as much as 2.5 percent to 5 percent of the wastewater volume, depending on the volume that could be recycled.

Reverse osmosis, as with ion exchange, results in a dilute, clean stream and a concentrated stream. The concentrate, which contains the substances removed from the wastewater, would require proper disposal. A portion of the concentrate could be recycled, but ultimately it would be disposed as a hazardous waste. The concentrate waste stream could be as much as 15 percent to 30 percent of the wastewater volume, depending on the volume that could be recycled.

Since dilution of the pond water to meet AWQC would provide the same level of environmental protection as treating the water using ion exchange or reverse osmosis, both ion exchange and reverse osmosis will be eliminated on the basis of cost.

The only feasible offsite treatment measure is treatment at a Publicly Owned Treatment Works (POTW). The transport of contaminated pond water for treatment should have no adverse impacts on the environment, public health or welfare, providing there is no spill during transport. Any residuals generated from treatment of pond water at the POTW would be the responsibility of the POTW. The POTW will not accept wastes that would interfere with plant operations, including use and disposal of sludge, or cause the NPDES limits for the POTW to be exceeded.

## POND SEDIMENT TREATMENT

Treatment technologies identified for sediments from Ponds 1, 2, and 5 are solidification/fixation, biological degradation, and dewatering. Successful treatment methods would result in remediation of the same contaminant pathways addressed by excavation. Treatment technologies are described below:

### **S** Solidification/Fixation (S/F)

For an S/F process to be effective, it must stabilize the wastes into a configuration which prevents physical migration and leaching of the waste constituents of concern in the sediment (in this case, metals and pesticides). The S/F process reagents or energy requirements must also be of relatively low cost, since material handling costs for excavation, mixing with reagents, and redeposition are relatively high. In addition, if the S/F process does not meet the leaching criterion, the treated wastes must still be placed in an approved RCRA disposal unit. Thus, additional costs associated with reagents, solids handling, solids mixing, and waste volume increase, in this case, would be unnecessary and substantial. Overall, none of the waste S/F processes appears to meet the solidification, nonleachability, and long-term effectiveness requirements for proper application as a process. The solidification/fixation technologies will not be considered for use in any remedial alternatives at the Gallaway Ponds site.

### - Biological Degradation

This technology involves the biological seeding of wastes with acclimated or mutant bacteria that will hasten natural biodegradation. There is very limited data on the use of this technology to degrade pesticides. Also, the process will not remove metals; therefore, it is eliminated from further consideration at the Gallaway Ponds site.

### - Dewatering

Municipal Treatment Plant sludge is commonly dewatered using mechanical equipment, such as a vacuum filter, plate and frame filter press, belt filter press, or centrifuge. The pond sediment at the Gallaway Ponds site may contain debris such as refuse, rusted drum pieces, sticks, logs, plant material, etc. The sediment would be difficult to pump under these conditions. Also, the debris would have to be removed prior to application to the dewatering equipment. Because of these constraints, mechanical sediment dewatering is eliminated from further consideration.

Air drying beds can be used to dewater sediment by both natural drainage and by evaporation from the surface exposed to air. This dewatering method will not require the removal of debris in the sediment prior to dewatering. However, due to the technical uncertainties in the effectiveness of air drying methods, dewatering is not considered for further evaluation at this time.

RECOMMENDED PROCEDURES FOR THE DISPOSAL OF SELECTED PESTICIDES

Land burial or ground surface disposal are the only other options suitable for the disposal of small quantities of these pesticides.

SEDIMENT DISPOSAL

Options considered for the pond sediments include disposal in an offsite RCRA landfill, an onsite RCRA landfill and the designated Pond #1 area. These options are described in the following section:

- Offsite Landfill

The offsite disposal of sediments is assumed to be at a hazardous waste management facility (HWMF) permitted in accordance with applicable EPA or state regulations based on the Resource Conservation and Recovery Act (RCRA).

The offsite disposal technology meets all of the criteria for screening: implementability, technical development, and applicability for site conditions. This technology is considered appropriate for removal action and will be included in the development of alternatives.

- Onsite Landfill

Onsite disposal of contaminated sediments for Ponds 1, 2, and 5 would be performed after the pond water has been removed. All of these materials are considered hazardous in accordance with Tennessee Department of Health & Environment (TDHE) Hazardous Waste Management Rules, Sec. 1200-1-11.

Landfill design will be in accordance with TDHE rules for hazardous waste landfills, Sec. 1200-1-11-.06.

Onsite landfilling of sediments is considered an appropriate technology for remediation of the contaminated sediments, and it will be retained for further evaluation.

- Centralization of Waste with Onsite Disposal in Pond 1

For this disposal option, sediments from Ponds 2 and 5 will be backfilled into Pond 1. The sediment removal and disposal operations will occur after the pond waters have been pumped out.

BACKFILL & REGRADE

Backfilling and regrading of Ponds 1,2, and 5 has been identified as a potential technology for remediation of the future risk associated with overflow of pond water into the unnamed tributary of Cane Creek. Backfilling and regrading is applicable only where pond sediments can be left in place without threat of future disturbance by mining.

Conventional earth-moving equipment, such as bulldozers and scraper pans are expected to accomplish the site grading work. Regrading and backfilling are considered appropriate technologies and will be included for development of remedial alternatives.

### ALTERNATIVES EVALUATION

The Feasibility Study developed a range of alternatives that would mitigate any unacceptable risks to receptors posed by seven of the onsite ponds (Ponds 1-7) and the areas of known surficial soil contamination based on data presented in the Remedial Investigation. Ponds 8 and 9 were not addressed for remediation because (1) due to site topography, they would not overflow and (2) sediments would not be disturbed since institutional controls would be implemented, to control mining. The only transport pathway would be addressed in the groundwater monitoring program.

As discussed above, the only unacceptable risk presented by the Gallaway Ponds Site is the potential risk to offsite biota that would occur if ponds 1, 2, or 5 were to overflow to offsite tributaries, since these ponds exceed the acute Ambient Water Quality Criteria (AWQC). This assumes a worst-case situation, since the tributaries are intermittent, and probably contain few biota receptors. The remedial objectives and cleanup criteria for this pathway are based on the acute AWQC levels for pond water contaminants. The general objectives are to eliminate the contaminated pond waters which exceed the acute AWQC, and to ensure that the remaining pond sediments do not contaminate future surface waters by contaminant diffusion.

The following seven remedial action responses were developed for a detailed analysis of public health, environmental, and institutional considerations and cost effectiveness:

1. No Action - Since there is no evidence that contaminants are present at the site at levels representing a significant threat to public health or the environment, the "No Action" Alternative will be considered as a feasible response.
2. Backfill/Regrade Ponds 1, 2, 5 - This action would eliminate ponds 1, 2 and 5 by removing the water and backfilling the ponds. This action would result in a final graded site area without depressions or catchments that could pond rainwater.
3. Excavation of sediments from Ponds 2, 5 with onsite disposal in Pond 1 - Sediment removal from Ponds 2 and 5 would prevent the future potential of contaminant diffusion into ponded water, which could occur following mining if these sediments were left on site. once drained, Pond 1 would then be backfilled with clean fill and regraded to prevent reponding of water, which could become contaminated through sediment diffusion.
4. Offsite Disposal of Pond 1, 2, 5 sediments in a RCRA Landfill - Sediment removal would prevent the distribution of sediments over a larger area that could result in contamination of runoff and surface waters by transport and diffusion of contaminants in sediments if mining resumed.

5. Disposal of Pond 1, 2, 5 sediments in an Onsite RCRA Landfill - An onsite hazardous waste landfill for pond sediments will effectively reduce to an acceptable level the future potential environmental risks to biota. Excavation of the contaminated sediments from Ponds 1, 2, and 5 would be required, at a minimum, and sediments would be disposed of in an onsite landfill. Removal of the contaminated sediments from Ponds 1, 2, and 5 would prevent any leaching or transport of the sediments and would prevent the onsite pond water contamination that causes a potential risk to biota if discharge to onsite tributaries occurs.
6. Monitoring - Monitoring would be used at various stages of the site remediation process to ensure the effectiveness of the remedial technologies and alternatives.
7. Pond Water Treatment - For each alternative that includes pond water treatment, three different treatment options have been identified. These are pumping and disposal at a POTW, dilution with city water or onsite treatment to meet all AWQCs, and blending of onsite ponds to meet organic AWQCs.

The alternatives were assessed relative to the following considerations:

- N Appropriate treatment and disposal technologies.
- N Special engineering considerations.
- N Environmental impacts and proposed methods for mitigating any adverse effects.
- N Operation, maintenance, and monitoring requirements.
- N Offsite disposal needs and transportation plans.
- N Temporary storage requirements.
- N Safety requirements for remedial implementation.

The following alternatives which are presented in Table 7 will be evaluated to determine the effectiveness of each alternative to meet these critical components:

### No Action

No Action will not require the implementation of any remedial cleanup, investigation, or monitoring actions. Technical and cost evaluations will not be performed.

An unacceptable risk to offsite biota would exist under the No-Action alternative if surface water run-off exceeding the AWQC intercepted the tributaries. The calculated risks to humans for all exposures pathways evaluated were less than  $10^{-6}$  and are therefore acceptable.

### No Action with Monitoring

No remedial action will be performed; however, a monitoring program would be implemented. This alternative includes installation of an offset well cluster downgradient of Pond 1 and another cluster downgradient of Ponds 8 and 9. The monitoring program would consist of sampling groundwater onsite and offsite. Table 8 summarizes the groundwater monitoring well programs for the first year for each of the remedial alternatives.

The risk identified in the NO-ACTION Alternative would also exist under this alternative. However, the groundwater monitoring program would be implemented as a precautionary measure to address the possibility of unexpected offsite migration of hazardous substances.

### Backfill and Regrade

After the water is removed from Ponds 1, 2, and 5, the ponds would be backfilled with local soils to cover the in-place sediments. The area adjacent to and between the ponds will be regraded and vegetated to promote surface water run off and to minimize ponding and infiltration. A minimum of 4 feet of backfill would be placed over the surface of the pond sediments. Approximately 15,000 cubic yards of fill would be required to backfill the ponds and to construct the graded fill. Conventional earthmoving equipment, such as scraper pans and dozers, would be appropriate for the site work. The grading plan would be designed to approximately balance cut and fill so that local soils would be used for the regraded area. Approximately 4 acres would be regraded. The equalization basin used for the pond-water batch mixing will be used as a sedimentation basin for the regraded area. The sedimentation basin would collect all storm water runoff from the regraded area and would remove sediments transported from the surface. The basin discharge would be the unnamed tributary of Cane Creek. Once the site vegetative cover has fully developed, the sedimentation basin may be removed (see Figure 4).

Another closure method would be to cap Ponds 1, 2, and 5 in-place in accordance with RCRA requirements.

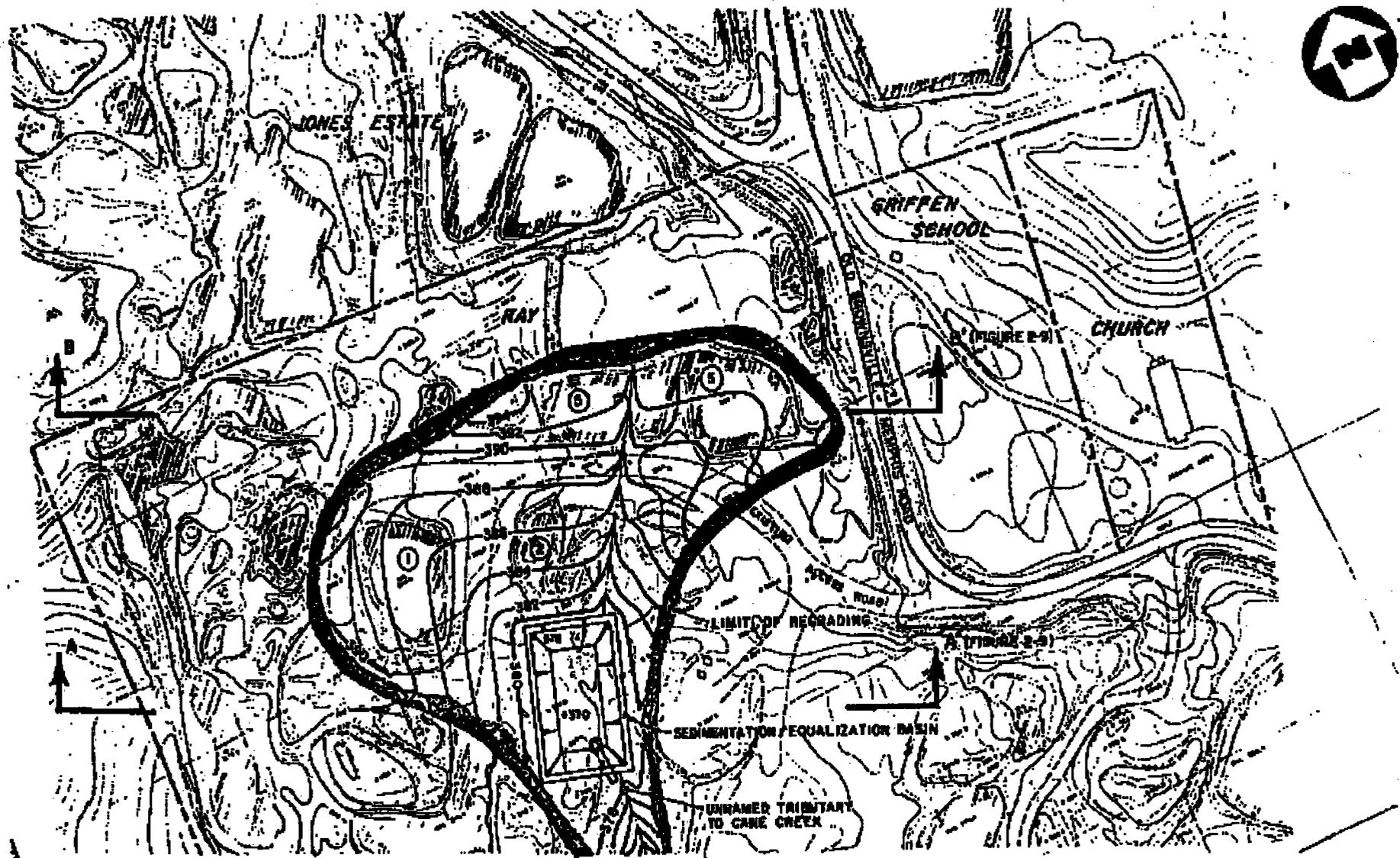
O&M activities would include groundwater sampling and inspection and maintenance of the sedimentation basin, vegetative cover or cap.

TABLE 8

PROPOSED GROUNDWATER MONITORING WELL PROGRAMS  
FOR THE VARIOUS REMEDIAL ALTERNATIVES  
GALLAWAY PONDS SITE - FOCUSED FEASIBILITY STUDY

Remedial Alternative	Existing wells	New Wells	Comments
No Action	—	—	No Monitoring
No Monitoring No Action	6	4 Offset	Install an offset well cluster downgradient of Pond 1 and another downgradient of Ponds 8 and 9 (each cluster consists of two wells - shallow (35') and deep (60'))
Backfill/Regrade Ponds 1, 2, 5	6	4 Offset	Install offset well clusters downgradient of Pond 1 and Ponds 8 and 9.
Excavate Ponds 2, 5 Sediment with Onsite Disposal in Pond 1 and Backfill/Regrade Pond 1	6	4 Offset	Install two offset downgradient of Ponds 8 and 9 and two offset downgradient of Pond 1.
Excavate Ponds 2, 5 Sediment with Onsite Disposal in Pond 1 and Cover Pond 1 with Multimedia Cap.	6	4 Offset	Install two offset downgradient of Ponds 8 and 9 and two offset downgradient of Pond 1.
Take Ponds 1, 2, 5 Sediment to Offsite RCRA Landfill	6	2 Offset	Install offset well cluster downgradient of Ponds 8 and 9.
Excavate Ponds 1, 2, 5 Sediment with Disposal in Onsite RCRA Landfill	1	3 RCRA landfill wells 2 offset	Utilize existing MW-2 for upgradient monitoring of onsite landfill. Install three new wells downgradient of landfill Install offset well cluster downgradient of Ponds 8 and 9.

NOTE: DOMESTIC WELL SAMPLING IS INCLUDED IN ALL ALTERNATIVES EXCEPT



PROPERTY LINES ARE BASED ON FAYETTE CO. TAX RECORDS, AND ARE NOT FIELD CHECKED.

FIGURE 4

BACKFILL AND REGRADING OF PONDS 1, 2, & 5  
GALLAWAY PONDS SITE, GALLAWAY, TN



TABLE 7

REMEDIAL ACTION ALTERNATIVES  
CAPITAL AND PRESENT-WORTH COSTS SUMMARY  
GALLAWAY PONDS SITE

<u>REMEDIAL ALTERNATIVE</u>	<u>CAPITAL</u>	<u>COST PRESENT-WORTH * (30 year O&amp;M)</u>
No Action	0	0
No Action with Monitoring	25,000	141,000
Backfill/Regrade Ponds 1,2,5 following:		
a. 1,2,5 water to POTW	364,464	537,000
b. Dilute 1,2,5 H <sub>2</sub> O with city H <sub>2</sub> O and discharge to tributary to meet AWQC.	317,889	491,000
c. Blend 1,2,5 H <sub>2</sub> O and discharge to tributary to meet pesticide AWQC	284,398	457,000
Backfill/Regrade Ponds 1,2,5 with Multi-media cap (RCRA cap)		
a. 1,2,5 water to POTW	453,243	629,000
b. Dilute 1,2,5 H <sub>2</sub> O with city water and discharge to tributary to meet pesticide AWQC.	406,668	580,000
c. Blend 1,2,5 water and discharge to tributary to meet pesticide AWQC	373,177	546,000
Excavate sediments from Ponds 2,5 with onsite disposal in Pond 1; backfill/regrade Pond 1		
a. 1,2,5 water to POTW	300,371	464,000
b. Dilute 1,2,5 H <sub>2</sub> O with city H <sub>2</sub> O and discharge to tributary to meet AWQC.	243,767	407,000
c. Blend 1,2,5 H <sub>2</sub> O and discharge to tributary to meet pesticide AWQC	220,304	384,000
Excavate sediments from Ponds 2,5 with onsite disposal in Pond 1 and cover Pond 1 with multi-media cap (RCRA cap)		
a. 1,2,5 water to POTW	401,339	565,000
b. Dilute 1,2,5 H <sub>2</sub> O with city H <sub>2</sub> O and discharge to tributary to meet AWQC.	344,735	508,00
c. Blend 1,2,5 H <sub>2</sub> O and discharge to tributary to meet pesticide AWQC	321,272	485,000

TABLE 7

Take Ponds 1,2,5 sediments to offsite RCRA landfill		
a. 1,2,5 water to POTW	955,296	1,072,000
b. Dilute 1,2,5 H <sub>2</sub> O with city H <sub>2</sub> O and discharge to tributary to meet AWQC	908,720	1,025,000
c. Blend 1,2,5 H <sub>2</sub> O and discharge to tributary to meet pesticide AWQC	875,229	992,000
Excavate Pond 1,2,5 sediments with disposal in onsite RCRA landfill		
a. 1,2,5 water to POTW	1,084,673	1,220,000
b. Dilute 1,2,5 H <sub>2</sub> O with city H <sub>2</sub> O and discharge to tributary to meet AWQC	1,038,097	1,173,000
c. Blend 1,2,5 H <sub>2</sub> O and discharge to tributary to meet pesticide AWQC	1,004,606	1,149,000

\* THESE COST REFLECT QUARTERLY SAMPLING FOR 0-2 YEARS AND ANNUAL SAMPLING 3-30 YEARS

CENTRALIZATION OF WASTE WITH ONSITE DISPOSAL IN POND 1

For this disposal option, sediments from Ponds 2 and 5 will be backfilled into Pond 1. The sediment removal and disposal operations will occur after the pond waters have been removed. An estimated 1,600 cubic yards of raw, undried sediment will be backfilled into Pond 1. Figure 5 shows the Pond 1 sediment disposal plan.

Pond 1 has an available disposal capacity of approximately 3,500 cubic yards, based on an estimated bottom elevation of 388 feet above mean sea level (AMSL) and berm elevation of 388 feet AMSL. The disposal capacity of Pond 1 can be easily increased by construction of a perimeter berm; however, this is not expected to be necessary.

The extra storage capacity of 1,900 cubic yards (3,500 minus 1,600) will be used for backfill soils to stabilize the "wet" sediments and allow final covering. Backfill of 1,900 cubic yards of "dry" onsite soils into 1,600 cubic yards of "wet" sediments will result in approximately 3,500 cubic yards of mixed soil/sediment.

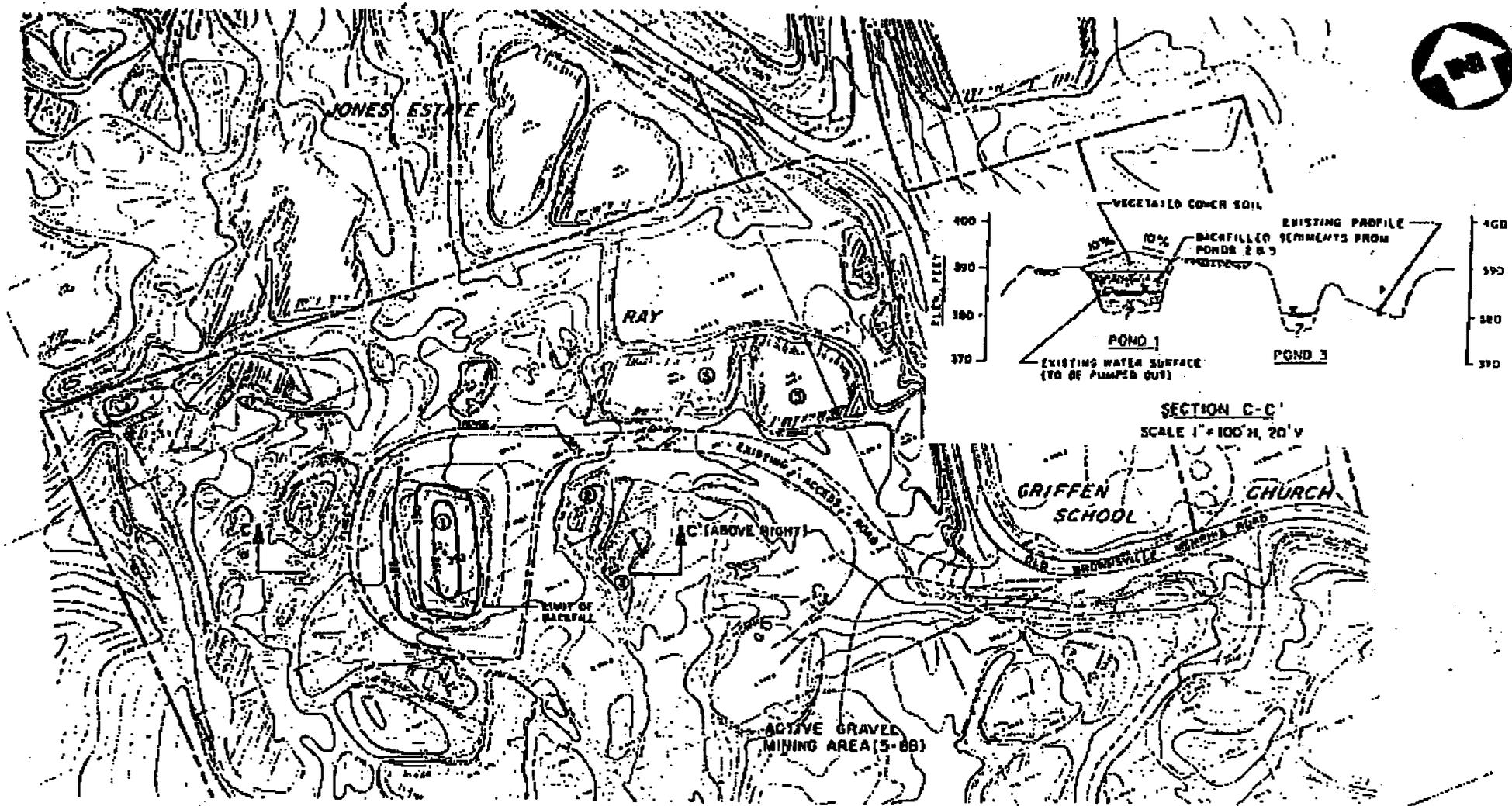
It is anticipated that after Pond 1 is backfilled with raw, wet sediments, settling will occur and a liquid supernatant layer will be formed. This liquid will be removed as required, and will be treated with the same method used for the pond water. This will result in an increase in sediment solids content with a corresponding increase in extra storage capacity above the estimated 1,900 cubic yards. This benefit from additional settling should be realized if Pond 1 is permitted to be undisturbed for at least one full, dry-weather day. The exact amount of increase in storage capacity is not determinable; however, the increased volume might be needed to allow for more backfill material if the actual sediment moisture contents and disposal quantities are significantly greater than estimated in the FS.

For one closure method, the backfilled Pond 1 will be covered with a local soil cover sloping away from the pond center. A 6-inch topsoil layer will be placed on the sloped soil cover and will be vegetated to minimize future erosion and rainfall percolation.

A second closure method for Pond 1 will be a multi-media cap consisting of 2-feet of clay, a synthetic membrane, and an internal drainage layer. A 2-foot vegetated soil cover will be placed above the drainage layer and will be sloped away from the pond center.

A 6-foot chain-link fence with a locking gate will be constructed around the Pond 1 disposal site to restrict site access and future mining activity.

O & M activities would include groundwater monitoring and inspection and maintenance of the cap or cover.



PROPERTY LINES ARE BASED ON FAYETTE CO TAX RECORDS, AND ARE NOT FIELD CHECKED.

FIGURE 5

SEDIMENT DISPOSAL INTO POND No. 1  
GALLAWAY PONDS SITE, GALLAWAY, TN

? - The depth of the contaminated sediment is unknown.

#### ONSITE RCRA LANDFILL

Onsite disposal of contaminated sediments from Ponds 1, 2, and 5 would be performed after the pond water has been removed. The disposal cell would cover an approximated 1.5-acre area. The onsite landfill would consist of a RCRA cap and double liner. The liner and cap both incorporate containment layers of 2 feet of compacted clay. The secondary liner is a 30-mil membrane. The liner system includes leachate collection and detection zones, both of which will be drained to separate storage tanks for leachate holding.

The cap consists of a clay/synthetic combination using a 20-mil membrane. The cap incorporates a gravel/sand drainage layer beneath the final 2-foot soil cover to promote drainage of percolating rainfall (see Figure 6).

The landfill will also include a minimum of four groundwater monitoring wells.

#### OFFSITE RCRA LANDFILL

After the water is removed from Ponds 1, 2, and 5, the sediments would be excavated from the pond bottoms. It is estimated that an average 2 feet of sediment would be removed from the bottom of each pond. This converts to a total volume of 2,215 cubic yards. The sediment is expected to be interspersed with vegetative matter and bulk solid wastes, such as domestic refuse and possibly metal drums. Clamshell or dragline-type excavating equipment would be appropriate for the pond sediment removal.

After the sediment layer has been removed from each pond, the pond bottom will be sampled at the surface (0-3 inches) and analyzed for HSL pesticides and metals. Analyses would be quick-turnaround (24 hours) to provide verification of cleanup action levels. Additional sediments would be excavated if contaminant concentrations exceed the designated action levels (see Table 4). Under this alternative, the ponds would not be backfilled, since removal of the sediments and water would effectively eliminate the future potential environmental risks, based on the present site data.

All excavated sediment and bulky wastes would be hauled offsite to a RCRA permitted hazardous waste management facility (HWMF). For costing purposes, the Chemical Waste Management Facility in Emelle, Alabama, has been identified. One-way haul distance is approximately 270 miles. Actual landfill selection would be determined by EPA following a Request for Quotation (RFQ) for hauling and disposal services.

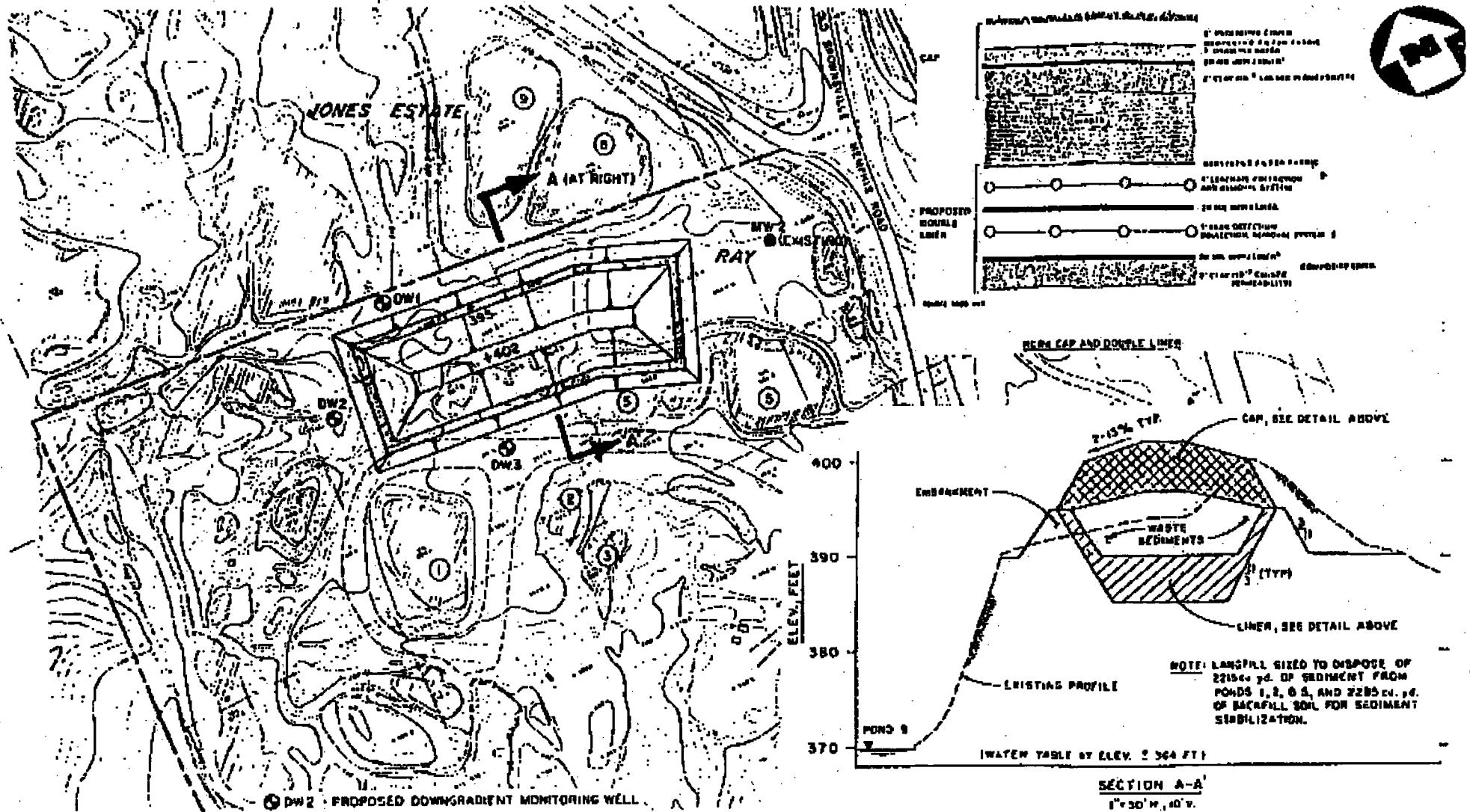


FIGURE 6

ONSITE RCRA LANDFILL  
GALLOWAY PONDS SITE, GALLOWAY

COMMUNITY RELATIONS

A public meeting was held on July 21, 1986, to present a summary of the RI/FS process and to explain the proposed remedies for the cleanup of the site. To aid in this presentation, fact sheets were prepared for the meeting. The public comment period officially begun on July 21 and closed on August 12, 1986. Comments received were responded to and are in summary form in the attached Responsiveness, Summary.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

The recommended remedial action is applicable, relevant, and appropriate to RCRA clean closure requirements. The site will be closed in accordance with Subtitle C of RCRA. The recommended action includes excavation of contaminated sediment from Ponds 2 and 5 with onsite disposal in Pond 1. This action will be in compliance with RCRA's clean closure requirements. In addition, a groundwater monitoring program which includes quarterly monitoring to establish background concentration levels and thereafter, semi-annually monitoring for the remaining of the post-closure care period way be appropriate.

Discharge of pond water to surface water may require a NPDES permit. The discharge limits will be specified in the permit. Effluent limits are not known until the permit application is reviewed and the state issues the limits.

RECOMMENDED ALTERNATIVE

The appropriate remedial action selected should be protective of human health and the environment, cost effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Additionally, the selected alternative should be consistent with the CERCLA compliance policy which requires consideration of RCRA applicable, relevant and appropriate requirements (ARAR's) when remediating and closing sites.

At a minimum, each alternative developed, with the exception of Alternative 1 ( No-Action) will provide a comprehensive response that meets the CERCLA goal of protection of the public health and the environment. Additionally, each alternative will include monitoring to evaluate the effectiveness of the remedial action.

The most cost-effective remedy that is applicable, relevant, and appropriate to RCRA requirements involves excavation of contaminated sediments from ponds 2 and 5 with onsite disposal in Pond 1. Pond 1 would be covered with a multi-media (RCRA) cap. The pond water would be diluted with city water to meet AWQC and discharged to a tributary.

The estimated cost to implement this remedy would be \$508,000 which includes O & M costs for 30 years.

OPERATION AND MAINTENANCE (O & M)

Operation and maintenance activities will include groundwater monitoring and inspection and maintenance of the cap. Projected O & M costs for quarterly sampling during the first year are \$40,600 (see Table 9). O & M costs are calculated using a present worth analysis calculation. This analysis was based on the office of Management and Budget - prescribed 10 percent discount rate.

Cost sharing for the project implementation will be 90 percent Federal and 10 percent State. After one-year, all O & M costs will be borne by the State.

SCHEDULE

The Record of Decision will be finalized in September 1986. The Remedial Design should be completed in April 1987. The Remedial Action should be completed in February 1988.

FUTURE ACTIONS

Future actions will include the office of Regional Counsel obtaining a Consent Order with the site owner to refrain from mining the remediated pond 1 area. This order will also include other institutional controls needed to ensure future land uses compatible with the remedy selected.

After the remedy is implemented, monitoring will be needed to ensure the effectiveness of the action.

TABLE 9

O & M COST SUMMARY - Pump Ponds 1, 2, 5; Dilute Onsite and Discharge Onsite; Remove Sediments From 2 and 5 and Dispose Onsite in Pond 1 with Multimedia (RCRA) Cap, Gallaway Ponds Site

ITEM	ITEM (\$) QUARTERLY SAMPLING
1. Sampling	8,000.00
2. Analysis	30,000.00
3. Maintenance	1,000.00
4. Reporting	1,600.00
TOTAL ANNUAL COST	40,600.00

## GALLAWAY PONDS

### GALLAWAY, TENNESSEE

#### DRAFT RESPONSIVENESS SUMMARY

##### INTRODUCTION

This responsiveness summary documents citizens' reactions and concerns raised in reference to the Remedial Investigation/Feasibility Study (RI/FS) for the Gallaway Ponds site in Gallaway, Tennessee. It also documents for the public record the United States Environmental Protection Agency's response to the questions and comments presented during the public meeting and public comment period.

##### OVERVIEW

The public meeting was held on July 21, 1986 to discuss the RI/FS and the proposed recommended alternative for the Gallaway Ponds site. The proposed remedial alternative included monitoring for two years after which the contaminated sediments would be centralized in one pond or taken to an offsite RCRA facility. Rather than monitor for 2-years, the Agency has decided to implement the sediment centralization remedy upfront and confirm with 30 years of monitoring. Notification of the meeting was accomplished through news releases and mailings to all interested parties listed in the Community Relations Plan (CRP). The meeting was attended by approximately 13 people including EPA, State officials and the press.

The Agency received no comments from the public during the 3-week public comments period.

##### BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Gallaway Ponds Site was first brought to the attention of the state by several local residents. It appears that while hunting in the vicinity they found sample bottles dumped into one of the ponds on the site. The men also noticed a disagreeable odor and according to a state official, could see where liquid wastes had been allowed to run into the pond. The concerned citizens alerted the Fayette County Environmental Officer who in turn contacted the State the first week of January 1982. Around the end of January, the State assigned one of its representatives to meet with the men at the site in an effort to determine the extent of the problem.

Residential wells were tested because of the concern over contamination of the shallow aquifer. No contamination was found.

When the site was first discovered in 1982, media interest was high. However, little media interest is shown at the present time. Local residents have shown minimal interest since the site's discovery.

SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC MEETING AND THE EPA RESPONSES

1.0 How often would the groundwater be monitored?

EPA Response: Quarterly for a period of one year. After the first year, monitoring will be performed semi-annually for 30 years.

2.0 What were the levels of contaminants found during the Emergency Response.

EPA Response: Table 6-3 of the Focused Remedial Investigation Report was referenced.

3.0 Who owns the land?

EPA Response: Mr. Billy Ray is the current owner.

4.0 Are there any existing wells onsite? Did you look for any old wells?

EPA Response: only one existing well was identified during the RI. The site owner drilled a drinking water well which penetrated the Jackson Clay.

**APPENDIX B**

**Five Year Review – October 4, 1993**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.  
ATLANTA, GEORGIA 30365

Site: Galloway Ponds  
Ponds: 7.8  
Circles: X 8.3 VI

MEMORANDUM

DATE:

SUBJECT: Galloway Ponds Superfund Site  
Galloway, Tennessee

TO: Joseph R. Franzmathes, Director  
Waste Management Division

FROM: Robert Jourdan, Chief *[Signature]*  
North Superfund Remedial Branch

THRU: Richard D. Green, Associate Director  
Office of Superfund and Emergency Response *[Signature]*

Please find the attached final copy of the *Policy Review of the Galloway Ponds Superfund Site in Galloway, Tennessee.*

The Record of Decision (ROD) for this site was signed on October 26, 1986. EPA performed response actions which included the excavation, solidification, and on-site disposal (RCRA cap landfilling) of site pond sediments containing hazardous materials (namely pesticides). These actions were completed in October 1987.

The enclosed "policy" Five Year Review, dated September 1993, incorporates comments received from the State of Tennessee and EPA Headquarters. The report states that the site remains protective of human health and the environment, documents the current conditions at the site, and makes recommendations regarding Operation and Maintenance activities and future site reviews. EPA will ensure that the response actions performed at the site remain protective by conducting reviews of response actions in the future. The next review should be completed by April 1997.

Approved by:

*Michael A. Green Dept/10* Date: 10/4/93  
Joseph R. Franzmathes, Director, Waste Management Division  
EPA, Region IV

Attachment



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## **EXECUTIVE SUMMARY**

Consistent with Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and Section 300.430(f)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), EPA Region IV has conducted a "policy" five-year review at the Gallaway Ponds Site. The Agency believes that five-year reviews should be conducted within five years of the initiation of the response action and every five years thereafter at all National Priorities List (NPL) sites where response actions have been concluded and hazardous substances remain at the site above health based levels or rather above levels that allow unlimited use and unrestricted exposure.

Further, although not required by CERCLA section 121 (C), but rather as a matter of "policy," the Agency believes that five-year reviews should also be conducted at those sites, such as the Gallaway Ponds Site, where the remedy was selected prior to the enactment of the Superfund Amendments and Reauthorization Act of 1986 (SARA). EPA Region IV has concluded its "policy" five-year review of the Gallaway Ponds Site and has determined that the response action performed at the site remains protective of human health and the environment. EPA's site review is based on its evaluation of the quarterly site monitoring data collected during the operational and functional period and a site visit conducted for the purpose of this review.

The Gallaway Ponds NPL Site (site) is a former sand and gravel mining quarry at which the disposal of hazardous substances, mainly pesticide wastes handled at the nearby Arlington Blending and Packaging NPL Site, occurred. Drums containing liquid wastes were disposed of by emptying or placing the entire drum into a number of water-filled quarry pits (or ponds) on the site. The contents of drums and other containers were released into the sediment and waters standing in the quarry pits.

The objective of the Gallaway Ponds response action was to eliminate contaminated pond waters which exceeded acute Ambient Water Quality Criteria (AWQC) and to ensure that the remaining pond sediments did not again contaminate subsequent surface water by contaminant

diffusion. The site response action, completed in October 1987, consisted of remediating the contaminated pond sediments detected in three of the nine ponds evaluated during the remedial investigation/ feasibility study (RI/FS). Contaminated waters were drained from the identified ponds. Remaining contaminated pond sediments were excavated and consolidated into the largest pond (Pond 1), where the sediments were mixed with kiln ash and compacted in place. The two smaller ponds (Ponds 2 and 5) were refilled with native soil and graded over. A multi-media Resource Conservation and Recovery Act (RCRA) cap was then constructed over the consolidated sediment and kiln ash mixture placed in the larger pond. The total site area covers approximately five acres, while the fenced area, within which the RCRA cap is located, equals approximately one acre.

The Record of Decision (ROD), governing the site response action, was based upon the assumption of unacceptable future risk to off-site aquatic biota, should contaminated pond waters overflow into a nearby tributary of the Cane River, at some future date, as the result of a storm event. The ROD, finalized on September 26, 1986, identified the following hazardous substances as contaminants of concern: arsenic, cadmium, chlordane, dieldrin, and toxaphene.

Based on the review of pertinent documents prepared both in lieu of and following the site response action and for the five-year review site inspection, EPA has concluded that the response action remains protective of human health and the environment. The response action's objective was successfully achieved by eliminating the contaminated pond waters that threatened nearby biota; excavating and fixating pond sediments that may have caused future surface water contamination; and constructing the RCRA multimedia cap which remains intact and serves as an effective barrier to water infiltration and exposure to the hazardous substances solidified and compacted underneath the cap.

Site media sampling was not conducted as part of this review. Rather, data, collected during the operational and functional period, was reviewed. The last quarterly ground-water sampling event took place in July 1990. Results of the quarterly sampling events are presented in Appendix A.

Review of site ground-water data revealed that both nickel and chromium were frequently detected at levels greater than their respective Maximum Contaminant Levels (MCL's). However, based on past disposal activities at the site, there is little evidence to suggest that the high metals concentrations can be attributed to the buried wastes or past disposal practices.

Currently, the only area that poses some concern regarding the future protectiveness of site response action is that of chronic ponding in the southwestern sector of the perimeter drainage channel that encircles the RCRA cap. The ponding is due to settlement in the clay that forms the channel and has subsequently caused rainwaters to be pooled for long periods. Discussions are currently ongoing between EPA and the State to undertake corrective actions at the site and to attain assurances from the State for long-term site maintenance.

## **1.0 INTRODUCTION**

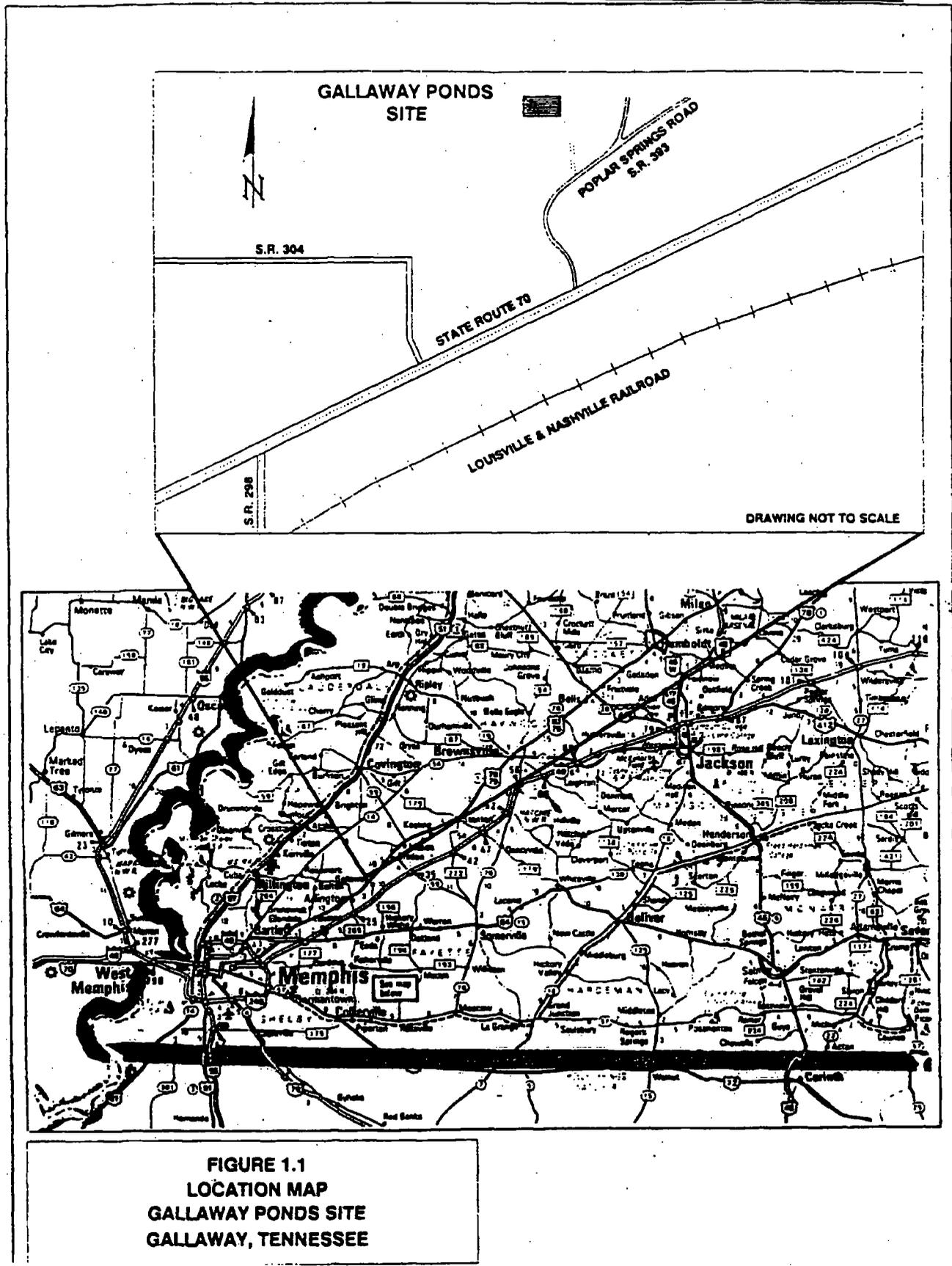
A "policy" five-year review has been conducted at the Galloway Ponds Site in accordance with Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and OSWER Directive 9355.7-02 (5/23/91) to evaluate whether the site's response action remains protective of public health and the environment. A review is to be performed within five years of the initiation of the response action and every five years thereafter at those NPL sites where hazardous substances remain in place above levels that allow for unlimited use of and unrestricted exposure to the site following completion of all response actions.

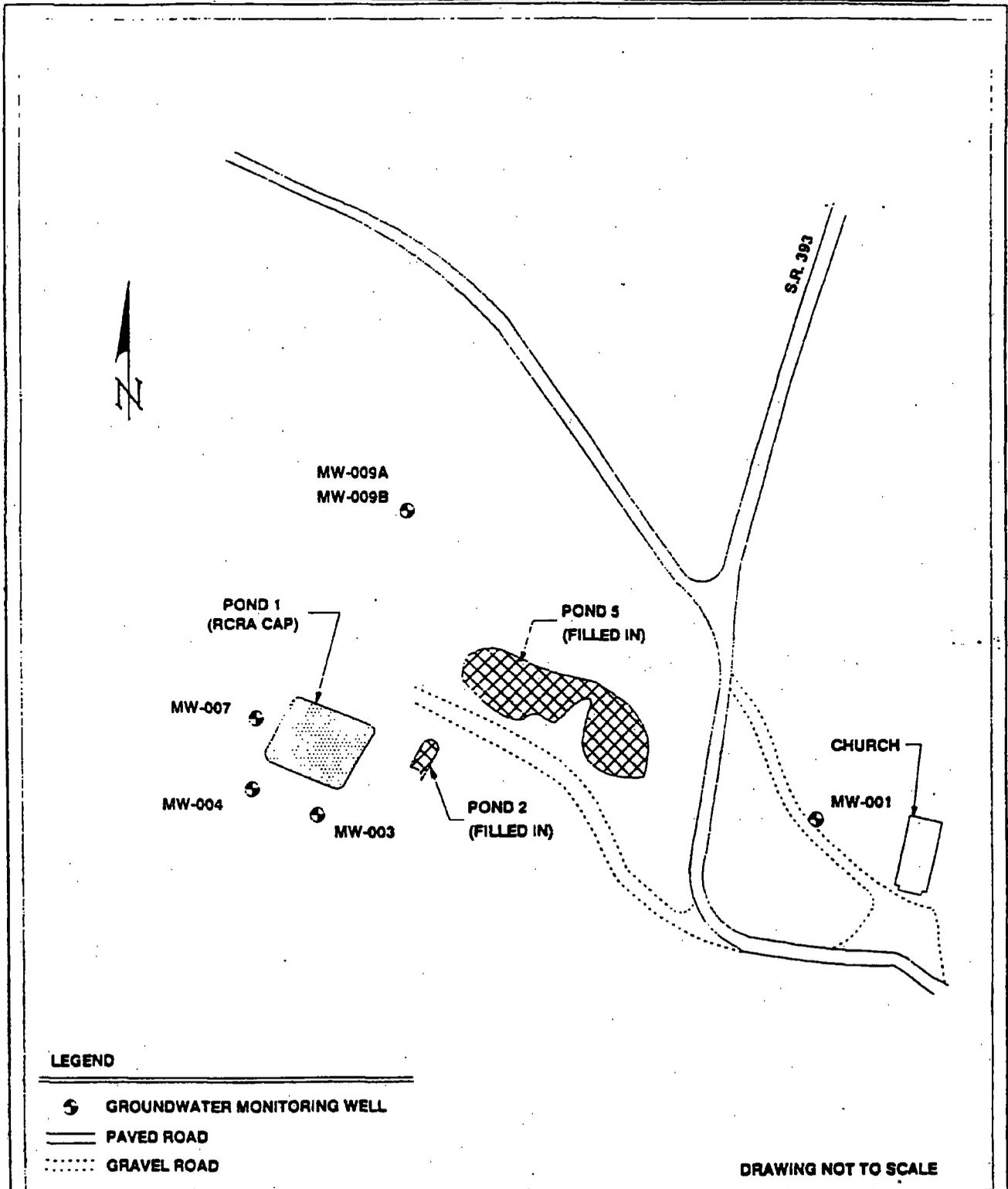
The purpose of the five-year review is to 1) confirm that the response action implemented remains protective of human health and the environment and 2) evaluate whether the original cleanup standards and/or applicable or relevant and appropriate requirements (ARARs) remain protective.

## **1.1 BACKGROUND**

### **1.1.1 SITE DESCRIPTION**

The Galloway Ponds NPL Site, sometimes referred to as the Galloway Pits NPL Site, is located 2.3 miles northeast of Galloway, Tennessee, in Fayette County, which is about 25 miles northeast of Memphis on State Road (S.R.) 72. U.S. Geological Survey (U.S.G.S.) map coordinates for the site are latitude 35°21'28" north, longitude 89°36'10" west (U.S.G.S., 1973). The site lies near the top of a low ridge composed mainly of gravel, sand, and clay terrace deposits. The ridge has been extensively mined for sand and gravel, producing a landscape dotted with water-filled quarry pits up to 50 feet deep. Some of these pits have been used for the disposal of residential trash, demolition debris, and appliances.





**FIGURE 1.2**  
**SITE MAP**  
**GALLOWAY PONDS SITE**  
**GALLOWAY, TENNESSEE**

The site encompasses the land area adjacent to and including nine ponds located within a currently inactive portion (5 acres) of a larger active sand and gravel operation (50 acres).

Land within about one mile of the site is used primarily for agricultural purposes. Two properties adjacent to the site are now or were recently used for gravel mining operations similar to those carried on at the Galloway Ponds Site. A church is located to the east of the site and some residences are within a one-mile radius of the site. The remainder of the land not used for agricultural or mining purposes is wooded.

The nearest surface water, with the exception of abandoned gravel pits that contain standing water, is an unnamed tributary of Cane Creek. Cane Creek drains southward into the Loosahatchie River.

The formations significant to the hydrogeology of the site are the Jackson Formation and the overlying water-bearing deposits. The Jackson Formation, roughly 90 feet in thickness, is important because it hydraulically separates the surficial aquifer, which produces only small domestic supplies, from the underlying, confined sands of the Claiborne group, which is a major municipal water source. Site wells are constructed in the surficial aquifer, which is comprised of sand and gravel units ranging from 20 to 30 feet thick.

The ground-water gradient is fairly flat across the site and tends to flow towards the northwest. A ground-water divide may exist on-site such that ground water in the northern half of the site tends to flow to the northwest, whereas ground water in the southern half of the site tends to flow to the southwest. The ground-water flow direction may be controlled to some extent by discharge into the nearby stream headwaters.

### 1.1.2 SITE HISTORY

Disposal of hazardous materials (pesticides) at the site occurred for an undetermined period of time, probably beginning in the late 1970's or early 1980's. Drums containing liquid wastes

were disposed by either placing the entire drum or its contents into a number of small ponds located on the site. Also, small glass bottles containing "quality control" samples from pesticide blending operations were disposed in the ponds.

In January 1982, the Tennessee Department of Environment and Conservation (TDEC) received a report from a citizen concerning the dumping of drums and smaller containers into a gravel pit near Gallaway, Tennessee. The citizen also indicated that there was a strong odor of pesticides in the area. TDEC personnel investigated the incident and noted that labels on some of the containers made reference to Arlington Blending and Packaging Company (ABAP), a small pesticide blending company located in Arlington, Tennessee.

The TDEC inspection of the site revealed that some of the containers had been removed from the pond. They later learned that the owner of ABAP had conducted the removal. During the inspection TDEC personnel collected water and sediment samples from the pit for analysis. The analytical results showed elevated levels of pesticides.

The Galloway Ponds Site was proposed for the NPL in December 1982. It was finalized in early 1983 and received a Hazardous Ranking Score of 30.77.

In October 1983, the EPA conducted an emergency cleanup of one of the larger site quarry pits, designated as Pond 1. The response action consisted of the excavation and off-site disposal of contaminated pond sediments and the on-site treatment of water drained from the pond. The treatment process involved the carbon filtration of the pond water to limits established by the Tennessee Department of Health and Environment, Division of Water Quality Control. The treated water was subsequently discharged to Ponds 2 and 3, located east of Pond 1. Drums containing hazardous substances were removed from the pond for off-site disposal.

The Remedial Investigation Report and the Feasibility Study Report were finalized in April 1986 and September 1986, respectively. The site ROD was also finalized in September

1986. The ROD identified the following five contaminants of concern: cadmium, arsenic, chlordane, dieldrin, and toxaphene.

The ROD was implemented by EPA as a removal action during the period from June 1987 through October 1987. The total volume of the solidified pond sediment and kiln dust material placed in the multimedia cap was estimated to be 9,200 cubic yards. The following actions were carried out to implement the ROD:

- Dilution of the water contained in Ponds 1, 2, and 5, with municipal water to meet Ambient Water Quality Criteria and subsequent discharge to an unnamed tributary;
- Excavation of contaminated sediments for Ponds 2 and 5 and consolidation of these sediments in Pond 1;
- Closure of the site under Subtitle C of the Resource Conservation Recovery Act (RCRA) by constructing a multi-media cap, consisting of grade fill, a gas drainage layer, an impermeable layer, a flexible membrane liner (FML), a drainage layer, geotextile fabric, and a vegetative topsoil layer over the pond sediments consolidated in Pond 1 and monitoring ground-water quality;
- Institutional controls, namely fencing around Pond 1 and restrictions on mining in the area surrounding the cap;
- Installation of two additional ground-water wells to monitor ground-water characteristics on site.

No mining is to be conducted in the area the following areas: (1) The fenced area that surrounds the RCRA cap and perimeter drainage channel; and (2) the 100-foot "exclusion" zone extending from the outside berm of the perimeter drainage channel. As stated in the site Operations and Maintenance Plan (1/89), the intent of the 100-ft wide exclusion zone is to prevent encroachment of nearby mining activities which could result in unstable slope conditions around the cap's perimeter. The selection of 100-feet from the drainage channel for the exclusion zone was arbitrary and has no bearing, other than the mining encroachment aspects, on the long-term stability of the cap.

EPA conducted its Operational and Functional (O&F) (or shake-down) period from April 1989 through July 1990 to determine if the remedy was functioning properly and performing as designed. The site field activities conducted consisted primarily of the following: (1) sampling the six (6) wells selected for ground-water monitoring and analyzing the ground-water samples to determine the effect of the landfill on the shallow ground water, and (2) completing operation and maintenance (O&M) observations and corrective actions. During that time an Operations and Maintenance Plan was developed and finalized under which long term site maintenance and monitoring activities are to be implemented.

O&F or maintenance and repair activities were performed by EPA in October 1989 which included the following: (1) site access roadway repair; (2) routine RCRA cap maintenance which included mowing, tilling, fertilizing, and sodding; (3) weed and brush removal from the perimeter drainage channel; (4) repair to erosional ditches caused by surface water runoff from the cap; (5) maintenance to the perimeter drainage channel; and (5) fertilizing and seeding outside the perimeter fence to promote grass growth and minimize future soil erosion.

Road repairs were undertaken because the site was found to be inaccessible due to the formation of an approximately 4 ft. x 4 ft. x 20 ft. drainage gully along the site access road. The gully was filled to grade and compacted by the weight of the contractor's machinery.

Perimeter drainage channel repairs were initiated at the two locations on the northeastern and southwestern sectors where severe settling had occurred as evidenced by standing water. A centerline survey of the drainage channel bottom was performed earlier which showed the slope or gradient of the clay subgrade underlying the drainage channel riprap to be severely compromised in the areas where settling has caused ponding to occur (See Appendix B).

Repairs to the northeastern drainage channel sector were completed by regrading and compacting the clay subgrade into the proper slope to promote drainage. Riprap found there was replaced because some of the riprap was intermingled with clay which tended to restrict water flow.

Repairs to the southwestern drainage channel sector could not be completed due to the severity of the settling that has occurred there. As with the northeastern sector, standing water was drained and the FML pulled back to expose the clay subgrade and to allow the saturated clays to air-dry. It was determined after observing the condition of the area that more extensive construction activities were required and could not be accomplished within the budget approved for the site maintenance and repair. The FML was then rolled back in place and topped with the riprap.

A total of ten (10) erosional swales, located both inside and outside the perimeter fence, were repaired. Each of the swales were filled in with native soils to approximately 2 inches below grade. After compaction of the fill, riprap was placed on top to allow storm water drainage. At the time of the site inspection repairs the erosional swales appeared intact with no significant deterioration.

In July 1990 plans and specifications, entitled Erosion Control and Stabilization Plan for the Perimeter Area (Appendix C), were prepared under which repairs to the RCRA cap drainage areas were to be carried out. The proposed repairs have not been conducted at this time, however, assurances from the State are currently being sought under which corrective actions will be implemented and long-term site maintenance activities will be conducted.

Four quarterly ground-water sampling activities were conducted at the six (6) site ground-water monitoring wells selected to monitor the impact of the landfill, if any, on shallow ground-water quality (Figure 2). The analytical results of this sampling are discussed further in Section 2.2.2. and presented in Appendix A.

The last site maintenance activities undertaken at the site were conducted in December 1991. The site is currently not being maintained on a regular basis. EPA, Region IV, has concluded its O&F period during which the site O&M Plan was developed and implemented.

Estimated costs for the performance of O&M, other than those associated with major settlement repairs to the cap, are presented in Appendix E and were obtained from the O&M plan. The cost summary presents those costs associated with routine and non-routine maintenance tasks, ground-water sampling and analysis, and facility operations.

## **1.2 RESPONSE ACTION OBJECTIVES**

As discussed in the ROD, the only unacceptable risk presented by the Galloway Ponds Site, prior to the response action, was the potential risk to off-site biota that may have occurred if water contained in Ponds 1, 2, or 5, and in excess of acute AWQC were to overflow into an off-site tributary. Risks to humans resulting from exposure to site contaminants were determined to be negligible. The overall objective of the response action was to eliminate the contaminated pond waters which exceeded acute AWQC, thereby ensuring that the remaining pond sediments would not contaminate future surface waters by contaminant diffusion. This objective was achieved during implementation of the site response action.

## **1.3 ARARs REVIEW**

Section 121(d) of CERCLA, as amended by SARA, requires attainment of Federal Applicable or Relevant and Appropriate Requirements (ARARs) and of State ARARs or State environmental or facility citing laws when such requirements are promulgated, are more stringent than Federal laws, and are identified by the State in a timely manner. The following ARARs apply to the response actions conducted at the Galloway Ponds NPL Site:

- National Safe Drinking Water Act Maximum Contaminant Levels (MCL);
- Tennessee's Hazardous Waste Management Regulations;
- Clean Water Act, Water Quality Criteria For Human Health, Fish and Drinking Water (AWQC); and
- Closure of the site under Subtitle C of the Resource Conservation Recovery Act (RCRA).

No other applicable or relevant and appropriate regulations having bearing on the remedy's protectiveness have been promulgated since the selection of the remedy.

## **2.0 SITE CONDITIONS**

### **2.1 BACKGROUND**

A site visit to the Gallaway Ponds Site was conducted on December 17, 1991, for purposes of this review. A detailed visual inspection of the site was performed in accordance with the Gallaway Ponds Site Operation and Maintenance (O&M) Plan, dated January 1988. In conjunction with the five-year review site visit, EPA conducted site maintenance and repair activities. No other site maintenance activities have been conducted since that time. A summary of the site observations can be found in the Site Trip Report (Appendix D).

#### **2.2.1 SURFACE AND RCRA CAP CONDITIONS**

No settlement, erosion, or ponding was noted on the grassed cap during the site visit. The vent pipes for the gas collection system were free from damage and did not appear to be blocked.

The perimeter drainage channel presently is operating in the manner for which it was designed with the notable exception of the southwestern sector of the drainage channel (further discussed in Section 1.1.2). Stagnant water conditions in this sector have promoted vegetative growth in the ponded area. The proliferation of plant growth is presently not impeding water flow, but presents a potentially more serious problem in that the root growth of these plants may provide a conduit for water infiltration into the waste fixated (solidified and compacted) underneath the cap. Still, even under this conservative scenario, the contaminants would still exhibit little or no affinity for water and would, therefore, remain relatively immobile in the presence of water in the subsurface. Thus, such a condition under which production of any mobile, measurable subsurface contaminant, resulting from leachate formation, is unrealistic.

The stone rip-rap surfaces appear to provide adequate cover to the FML (erosion control fabric) underneath. Neither erosion nor rip-rap sloughing was evident in the drainage channel

or on the channel side slopes. The FML, which lies on top of the clay channel bottom, was exposed to sunlight, which tends to degrade the fabric, in several isolated spots where rip-rap cover had shifted.

Each of the six site ground-water wells being used for O&M monitoring purposes was in good condition, with all guard posts and protective casings intact with the following exceptions: (1) The lock and riser cap on background well, MW-001, are missing; (2) the concrete pads on well MW-001 and MW-002 have numerous cracks and should be repaired; (3) the guard post on MW-007 is slightly damaged; and (4) the concrete pads on the three (3) monitoring wells located inside the RCRA cap fencing (MW-003, MW-004, and MW-007) are unrepairable and need to be replaced.

The 100 foot exclusion zone was not being used for any mining activities but was inaccessible to the west and south of the cap, due to high water levels in the two ponds located there. Vegetation in the exclusion zone was cut to about the thirty foot limit at the time of the site visit, however, vegetation beyond this limit was over the required minimum height of two feet. There were no trees or bushes growing in the zone and the visible slopes had little or no erosion or rip-rap sloughing. Several erosional swales, apparently not addressed during the October 1989 O&F activities, are in need of repair.

The surface water in the two ponds adjacent to the cap were high during the site inspection as the result of frequent rainfall. However, high surface water in site ponds on site and immediately adjacent to the cap does not reflect the water-table surface. The ponds are situated above the water table and contain highly silted bottoms which presumably allow for little infiltration into the subsurface under normal conditions. According to the April 1986 remedial investigation report and water level measurements obtained by TDEC in June 1993, the water table (reported as elevation 365 ft-msl and 362 ft-msl, respectively) is located approximately 15 feet below the bottom the RCRA cap impoundment (or Pond 1).

The site security fence that surrounds the perimeter of the cap was in good condition, secure with no breaches. The double gate at the cap entrance was also in good condition, however, a post should be placed in the gates' gap to deter unauthorized entry. Presently there is a chain and lock securing the double gate.

Additional repairs were made to the access road at the time of the site visit.

## 2.2.2 GROUND-WATER CONTAMINATION

Quarterly O&F ground-water sampling events were conducted at the Galloway Ponds Site over the period beginning July 1989 and ending July 1990. Tables A-1 through A-6 (Appendix A) list the results of these sampling events and that of two previous sampling events conducted during the site remedial investigation and following the conclusion of the response action. The April 1986 remedial investigation sampling event and the June 1988 post-response action sampling event were included in the table to provide a comparison of ground-water quality at the site over several years.

Nickel and chromium, were detected at levels above the MCL several times in ground-water monitoring wells MW-003, MW-004, MW-009A, and MW-009B during the six sampling events. The MCL for both nickel and chromium is 100 µg/l.

Nickel detections ranged from below detection limit to 680 µg/l; the highest value was detected in MW-003 during the first quarter sampling event. Chromium levels detected ranged from below detection limit to 1,200 µg/l in well MW-004 in the third quarter. Nickel was present in excess of the MCL in four out of five sampling periods in MW-009A (constructed to a depth of 52 feet), however, chromium was not detected above the MCL in this well during any of the sampling events. Nickel was detected above the MCL in two of the five sampling periods in MW-009B (constructed at a depth of 39 feet), but chromium was detected in excess of MCL in each of the sampling events. Nickel was present above the MCL in only one sampling event in MW-007 and background well, MW-001, and was not

detected or detected in very low concentrations in all other sampling events for these two wells. Figures B.1 through B.7 (Appendix A) graphically represent the concentrations in the wells for the six sampling events.

It is unlikely that the presence of nickel and chromium in elevated levels is attributable to the past, documented, disposal activities at the site since the waste contained on site primarily consists of pesticides. The presence of high concentrations of nickel and chromium in site wells suggests that maybe these two contaminants possibly occur at levels above the MCL naturally or that there is another up-gradient source of nickel and chromium in the ground water. The high concentrations of these contaminants might also be due to the monitoring wells themselves. The stainless steel well casings are comprised of both nickel and chromium and are subject to corrosion under acidic conditions.

The graphs in Appendix A show the concentrations of nickel and chromium in the monitoring wells over time. All wells exhibit what appears to be a peak in one quarter of sampling. However, the peaks randomly occur in either the first, second, or third quarters. Since there is no direct correlation between the time and location of these peaks, it is difficult to draw a firm conclusion as to why they occurred.

### 2.2.3 SUMMARY OF SITE CONDITIONS

The site conditions remain good with two notable exceptions. Though the response action physical constructions, namely the cap, cap fencing, and monitoring wells remain effective, natural elemental deterioration, exacerbated by lack of maintenance, is evident. At this time problems elaborated on earlier are aesthetic and have no adverse impact upon the integrity of the response action in terms of its protectiveness to human health and the environment. Secondly, the settlement/ponding in the southwestern sector of the drainage channel has caused this area to become totally saturated with stagnant water, which in turn facilitates woody plant growth there. Possibly the roots of these plants could breach the protective cap

layers and provide a path for water to contact the fixated pond sediment contained underneath.

Other concerns at the site include the following: Several well pads are in need of repair; at least one ground-water well casing lock is missing; erosional gullies need to be attended while they are still small; and uncontrolled plant growth both within the fenced area and in the exclusion zone threaten to make the site physically inaccessible for inspection of the site. At the time of the site inspection the access road, though passable, showed signs that water drainage had again begun to erode away the road's surface.

### **3.0 RECOMMENDATIONS**

#### **3.1 RECOMMENDATIONS**

The response action implemented at the site involved the placement of solidified site pond sediment, contaminated with RCRA hazardous waste, into a land-based containment unit or multimedia cap. CERCLA section 121(d) (2) states that for wastes left on-site, response actions must comply with Federal and State environmental laws that are legally applicable or are relevant and appropriate under the circumstances of the release.

RCRA Subtitle C requirements regulate the land disposal of contaminated site media and are, thus, relevant and appropriate to this response action for as long as the wastes remain on site above health based levels. Under this regulation two basic closure options exist: (1) closure by removal (clean closure) where all contaminated media are excavated for off-site disposal or decontaminated to health-based advisory levels; and (2) closure with waste in place where contaminated media remain with a cover over the material. Closure requirements under this option dictate that post-closure care and maintenance to the multimedia cap and adjacent grounds and ground-water monitoring be conducted.

The post-closure scenario that exists at the Galloway Ponds Site is that of "closure with waste in place" or more specifically, "hybrid-landfill closure." Wastes being contained on site do not pose a threat to ground water, so hybrid-landfill closure rather than landfill closure more properly describes site conditions.

Currently, the RCRA cap's effectiveness is compromised due to the severe settling in the southwestern sector of the drainage channel, erosional swales that exist within the exclusion zone, and the lack of regular grounds maintenance. Corrective actions should be undertaken by EPA and the State to address these matters.

A set of plans were previously prepared in July 1990 to evaluate the causes of both the drainage channel ponding and the storm-water drainage problems that have facilitated creation

of erosional swales in the exclusion zone and to devise a means of resolving these problems in an efficient and prudent manner. The plan, located in Appendix C, recommends that the entire drainage ditch be regraded to a more uniform gradient and that the exclusion zone also be regraded to a less steep slope. The profiles of the perimeter drainage channels, located in Appendix B, show the existing channel grade and the proposed grade that would eliminate any ponding within the channel.

Regular site maintenance activities should be begun immediately. The Operation and Maintenance (O&M) Plan for the Galloway Ponds Site, dated January 1988, describes those activities that should be conducted to properly maintain the site. The O&M Plan should be amended, as warranted, to accommodate more practical site maintenance procedures. The site needs continued maintenance, such as mowing the grass on the cap to aid in storm water runoff and control of vegetation growth on the cap and in the exclusion zone to allow visual inspection. Additions or repairs to the site security fence should be considered to eliminate any risk of unauthorized access to the site.

The ground-water sampling program should remain in effect for as long as waste remains in place, however, albeit on a less frequent basis. Ground-water monitoring should be conducted at least once every five years in order to assess ground-water quality in preparation for the five year reviews that will follow. The chemical nature of the contaminants as well as their current fixated state do not warrant more frequent ground-water monitoring. The pH of water obtained from the wells should be observed and documented since high pH of the ground water may break down the elements in the stainless steel wells. All samples should be analyzed for metals, pesticides/PCBs, and cyanides to be consistent with past sampling events.

Since there is adequate vegetation on the cap, the soil pH and nutrients test are not necessary. If stressed vegetation is encountered in future sampling events these tests should be performed and the results documented.

### 3.2 STATEMENT OF PROTECTIVENESS

The ROD was implemented to address the conclusion reached in the RI/FS risk assessment, which was that the only unacceptable risk presented by the site was that of future risk to off-site biota (fish). The primary exposure pathway for contaminant migration to these receptors would have been that of surface water transport of site contaminants, should one or all of the three contaminated ponds (Ponds 1, 2, and 5), identified during the RI/FS, have overflowed into the nearby Cane River tributary, thereby presenting risk to aquatic biota found there. The purpose of the response action was to remove this pathway.

The site response action objective was accomplished by entirely eliminating the potential for contamination of pond water by contaminated sediments in the following manner: First, by draining the contaminated water contained in the ponds; excavating the remaining contaminated sediments; and solidifying pond sediments in-place at Ponds 1, 2, and 5, with kiln dust; and then consolidating and compacting the total pond sediment/kiln dust mixture from Ponds 2 and 5 into Pond 1.

Risk to human health was also evaluated during the risk assessment, and it was determined that risks to humans from both dermal contact and ingestion of all contaminants detected were negligible (less than  $10^{-6}$ ). In short no exposure route from site contaminants to human receptors was determined.

The only potential site risks that remain are those associated with leaching of the buried sediments and resulting ground-water contamination. Realistically, the possibility of leachate production is remote due to the following factors: (1) the contaminants identified at the site have little affinity for water and, thus, would not be prone to leaching; (2) the contaminants are fixated (solidified in kiln dust and compacted); (3) the capped waste is located approximately 15 feet above the water table and, thus, the capped waste is not subject to lateral ground-water movement; and (4) the multimedia cap cover, which is comprised of two

feet of compacted clay, eliminates water percolation into the waste and, thus, mitigates the possibility of vertical leaching.

Currently, the cap appears to be in good condition with the exception of ponding in the southwestern sector of the perimeter drainage channel. This ponding has been present for quite some time and if not corrected may have an adverse impact on the integrity of the cap. As already discussed the combination of the ponded water and the lack of regular site maintenance promotes the uncontrolled plant growth in the drainage channel. Roots from woody plants in the ponded area could breach the cap layers and provide a conduit for water to percolate through to the capped waste.

In summation the Galloway Ponds Site remains protective of human health and the environment in that the RCRA cap remains a barrier to any realistic contact with the encapsulated wastes and serves to mitigate ground-water contamination. The effectiveness of the site response action, however, is severely compromised due to the chronic drainage channel settling and lack of routine O&M. No current risks to human health or the environment exists at this site with respect to exposure to contaminants now buried on site. As stated earlier the contaminant levels detected during the RI/FS on site were well below any health based levels that would be of risk to humans, and in its capped state the buried waste also presents no current or future risk to aquatic biota. Thus, no realistic contaminant migration pathway currently exists for which an endangered receptor might be exposed to site contaminants.

### 3.3 NEXT REVIEW

Since buried waste remains on site, EPA guidance mandates that five-year reviews continue to be conducted to evaluate the site's status. Therefore, it will be necessary to re-evaluate the effectiveness of the site by April 1997.

### **3.4 IMPLEMENTATION REQUIREMENTS**

As stated in Section 3.1 environmental media contaminated with RCRA hazardous waste are contained on site and are subject to RCRA Subtitle C Closure requirements for as long as waste remains in place on site. The RCRA Subtitle C regulations limit the options under which the site can be handled once the presence of RCRA waste has been established. The available options are limited to the following: (1) start-up of regular site maintenance as spelled out in the Operations and Maintenance Plan; and (2) "clean closure" of the site which would mean removal and/or decontamination of the encapsulated contaminated pond sediments.

The implementation of either of these options requires the full participation of both EPA and the State of Tennessee in terms of cost sharing of any additional funding requirements for response actions at the site and assurances by the State that long-term O&M will be carried out .

## LIST OF DOCUMENTS REVIEWED

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Basis of Design Report, prepared by Environmental Science and Engineering, Inc.

December 1987.

Erosion Control and Stabilization Plan, prepared by Environmental Science & Engineering,

Inc., July 1990.

Final Closure Report, prepared by Ebasco Services, Incorporated, February 1988.

Final Field Operations Plan, prepared by Ebasco Services, Incorporated, June 1989.

Focused Feasibility Study, prepared by NUS Corporation, September 1986.

Maintenance and Repair Oversight Report, prepared by Hunter/ESE, December 1989.

Operation and Maintenance Plan, prepared by Environmental Science and Engineering, Inc.

January 1988.

Record of Decision, Remedial Alternative Selection, prepared by EPA, September 26, 1986.

Galloway Ponds Removal Action, prepared by EPA, October 1987.

Specification for Maintenance and Repair Activities, prepared by Ebasco Services,

Incorporated, July 1989.

Work Plan For Conducting A Remedial Design Including Technical Assistance, prepared

by Ebasco Services, Incorporated, July 1987.

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**APPENDIX A**

**GROUND-WATER DATA**

TABLE A.1 CONTAMINANTS DETECTED IN MONITOR WELL MW-001  
GALLAWAY PONDS SITE, GALLAWAY, TN

	ARAR	April 86	June 88	July 89 1st	Dec. 89 2nd	April 90 3rd	July 90 4th
<b>INORGANICS</b>							
ALUMINUM	n/a	1,100J	3,700	1,300J	3,200J	--	--
BARIUM	2,000	--	40	35	51	23	22
CALCIUM	n/a	41,000J	25,000	22,000	19,000	6,600	8,100
CHROMIUM	100	23J	34	36	78	10	--
COPPER	[1,000]	98J	170	240	180	--	7
IRON	n/a	1,200J	3,000	2,000J	5,000	--	130
LEAD	15*	6	--	12	13	--	--
MAGNESIUM	n/a	--	2,300	2,300	2,700	1,500	1,600
MANGANESE	n/a	52	150	96	200	17	20
NICKEL	100	110J	--	21	19	--	--
POTASSIUM	n/a	3,300J	2,500	2,000	2,000	--	2,800
SODIUM	n/a	38,000J	10,000	11,000	10,000	--	11,000
STRONTIUM	n/a	NA	110	NA	NA	NA	NA
TITANIUM	n/a	NA	67	NA	NA	NA	NA
ZINC	[5,000]	64J	75	--	39	--	37
<b>ORGANICS</b>							
PHENOL	n/a	NA	1.3J	NA	NA	NA	NA
<b>PESTICIDES/PCBs</b>							
ALL	n/a	--	--	--	--	--	--

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements

All ARARs are the Drinking Water Standard Maximum Contaminant Level, November, 1991, except for values in [ ]

[ ] = ARAR is the Clean Water Act Ambient Water Quality Criteria for Water and Aquatic Life.

n/a = ARAR not available

-- = not detected

Shaded values indicate the ARAR was exceeded

NA = not analyzed

\* = MCL Action Level

All concentrations are in µg/l

J = estimated value

TABLE A.2 CONTAMINANTS DETECTED IN MONITOR WELL MW-003  
GALLAWAY PONDS SITE, GALLAWAY, TN

	ARAR	April 86	June 88	July 89 1st	Dec. 89 2nd	April 90 3rd	July 90 4th
<b>INORGANICS</b>							
ALUMINUM	n/a	890J	1,000	--	--	--	--
BARIUM	2,000	--	64	54	76	51	--
CALCIUM	n/a	13,000J	13,000	12,000	15,000	12,000	250
CHROMIUM	100	21J	89	520	120	17	--
COBALT	n/a	NA	--	9	--	--	--
COPPER	[1,000]	84J	21	--	34	--	--
IRON	n/a	1,500J	1,300	2,900J	1,900	--	2,600
MAGNESIUM	n/a	20,000J	2,900	2,400	3,200	2,600	17,000
MANGANESE	n/a	140	130	88	67	16	14
NICKEL	100	180J	520	680	380	260	250
POTASSIUM	n/a	--	--	--	970	--	NA
SODIUM	n/a	21,000J	18,000	18,000	22,000	17,000	860
STRONTIUM	n/a	NA	80	NA	NA	NA	NA
TITANIUM	n/a	NA	12	NA	NA	NA	NA
ZINC	[5,000]	54J	16	290J	20	--	7
<b>ORGANICS</b>							
2-METHYLPHENOL	n/a	NA	4.5J	NA	NA	NA	NA
<b>PESTICIDES/PCBs</b>							
ALL	n/a	--	--	--	--	--	--

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements

All ARARs are the Drinking Water Standard Maximum Contaminant Level, November, 1991, except for values in [ ]

[ ] = ARAR is the Clean Water Act Ambient Water Quality Criteria for Water and Aquatic Life.

n/a = ARAR not available

Shaded values indicate the ARAR was exceeded

All concentrations are in  $\mu\text{g/l}$

-- = not detected

NA = not analyzed

J = estimated value

TABLE A.3 CONTAMINANTS DETECTED IN MONITOR WELL MW-004  
GALLOWAY PONDS SITE, GALLOWAY, TN

	ARAR	April 86	June 88	July 89 1st	Dec. 89 2nd	April 90 3rd	July 90 4th
<b>INORGANICS</b>							
ALUMINIUM	n/a	680J	5,600	2,000J	NA	10,000	16,000
ANTIMONY	5-10	NA	--	--	NA	--	16J
BARIUM	2,000	--	76	86	NA	84	170
CALCIUM	n/a	18,000J	20,000	25,000	NA	9,700	12,000
CHROMIUM	100	--	73	310	NA	1,200	250
COBALT	n/a	NA	--	12	NA	8	--
COPPER	[1,000]	28J	--	--	NA	--	34
IRON	n/a	1,200J	8,600	7,200J	NA	17,000	24,000
LEAD	15*	--	--	6	NA	4J	16J
MAGNESIUM	n/a	3,300J	2,400	3,100	NA	2,200	3,200
MANGANESE	n/a	220	190	330	NA	110	310
NICKEL	100	110J	120	320	NA	240	200
SODIUM	n/a	38,000J	13,000	11,000	NA	--	12,000
STRONTIUM	n/a	NA	80	NA	NA	NA	NA
TITANIUM	n/a	NA	12	NA	NA	NA	NA
VANADIUM	n/a	NA	--	--	NA	18	35
ZINC	[5,000]	15J	14	--	NA	--	60
<b>ORGANICS</b>							
CHLOROFORM	[5.67]	36J	NA	NA	NA	NA	NA
<b>PESTICIDES/PCBs</b>							
ALL	n/a	--	--	--	NA	--	--

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements

All ARARs are the Drinking Water Standard Maximum Contaminant Level, November, 1991, except for values in [ ]

[ ] = ARAR is the Clean Water Act Ambient Water Quality Criteria for Water and Aquatic Life

n/a = ARAR not available

Shaded values indicate the ARAR was exceeded

\* = MCL Action Level

J = estimated value

-- = not detected

NA = not analyzed

All concentrations are in µg/l

TABLE A.4 CONTAMINANTS DETECTED IN MONITOR WELL MW-007  
GALLAWAY PONDS SITE, GALLAWAY, TN

	ARAR	April 86	June 88	July 89 1st	Dec. 89 2nd	April 90 3rd	July 90 4th
<b>INORGANICS</b>							
ALUMINUM	n/a	690J	520	--	NA	NA	NA
BARILM	2,000	--	64	36	NA	NA	NA
CALCIUM	n/a	15,000J	19,000	12,000	NA	NA	NA
CHROMIUM	100	10J	18	20	NA	NA	NA
COPPER	[1,000]	140J	71	77	NA	NA	NA
IRON	n/a	2,600J	680	--	NA	NA	NA
MAGNESIUM	n/a	3,300J	3,600	1,700	NA	NA	NA
MANGANESE	n/a	190	290	87	NA	NA	NA
MERCURY	[0.151]	--	--	4.4J	NA	NA	NA
NICKEL	100	140J	27	31	NA	NA	NA
SODIUM	n/a	25,000J	19,000	19,000	NA	NA	NA
STRONTIUM	n/a	NA	95	NA	NA	NA	NA
TITANIUM	n/a	NA	19	NA	NA	NA	NA
ZINC	[5,000]	82J	39	--	NA	NA	NA
<b>ORGANICS</b>							
PHENOL	n/a	NA	7.1J	NA	NA	NA	NA
<b>PESTICIDES/PCBs</b>							
HEPTACHLOR EPOXIDE	.2	NA	--	0.12	NA	NA	NA

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements

All ARARs are the Drinking Water Standard Maximum Contaminant Level, November, 1991, except for values in [ ]

[ ] = ARAR is the Clean Water Act Ambient Water Quality Criteria for Water and Aquatic Life.

n/a = MCL not available

Shaded values indicate the ARAR was exceeded

All concentrations are in µg/l

-- = not detected

NA = not analyzed

J = estimated value

TABLE A.5 CONTAMINANTS DETECTED IN MONITOR WELL MW-009A  
GALLAWAY PONDS SITE, GALLAWAY, TN

	ARAR	April 86	June 88	July 89 1st	Dec. 89 2nd	April 90 3rd	July 90 4th
<b>INORGANICS</b>							
ALUMINUM	n/a	NA	5,800	--	--	--	--
BARIUM	2,000	NA	60	61	56	53	51
CALCIUM	n/a	NA	17,000	1,900	18,000	17,000	15,000
CHROMIUM	100	NA	20	95	52	18	21
IRON	n/a	NA	4,500	2,500J	1,900	--	670
MAGNESIUM	n/a	NA	5,500	6,000	6,100	5,700	5,200
MANGANESE	n/a	NA	370	120	220	64	87
NICKEL	100	NA	--	340	370	390	250
POTASSIUM	n/a	NA	3,000	--	1,300	--	980
SODIUM	n/a	NA	23,000	26,000	25,000	27,000	25,000
STRONTIUM	n/a	NA	110	NA	NA	NA	NA
TITANIUM	n/a	NA	55	NA	NA	NA	NA
ZINC	[5,000]	NA	19	--	20	--	9
<b>ORGANICS</b>							
ALL	n/a	NA	--	NA	NA	NA	NA
<b>PESTICIDES/PCBs</b>							
ALL	n/a	NA	--	--	--	--	--

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements

All ARARs are the Drinking Water Standard Maximum Contaminant Level, November, 1991, except for values in [ ]

[ ] = ARAR is the Clean Water Act Ambient Water Quality Criteria for Water and Aquatic Life.

n/a = MCL not available

-- = not detected

Shaded values indicate the ARAR was exceeded

NA = not analyzed

All concentrations are in µg/l

J = estimated value

TABLE A.6 CONTAMINANTS DETECTED IN MONITOR WELL MW-009B  
GALLOWAY PONDS SITE, GALLOWAY, TN

	ARAR	April 86	June 88	July 89 1st	Dec. 89 2nd	April 90 3rd	July 90 4th
<b>INORGANICS</b>							
ALUMINUM	n/a	NA	36,000	2,800J	26,000J	3,300	1,000
BARIUM	2,000	NA	140	120	140	120	100
CALCIUM	n/a	NA	37,000	46,000	46,000	55,000	45,000
CHROMIUM	100	NA	120	310	900	290	310
COPPER	[1,300]	NA	31	--	26	--	10
IRON	n/a	NA	17,000	5,200J	23,000	4,300	4,100
LEAD	15	NA	--	--	9	--	5J
MAGNESIUM	n/a	NA	13,000	15,000	16,000	18,000	15,000
MANGANESE	n/a	NA	160	37	89	25	21
NICKEL	100	NA	72	63	160	120	99
POTASSIUM	n/a	NA	--	--	1,800	--	1,200
SODIUM	n/a	NA	40,000	38,000	37,000	43,000	43,000
STRONTIUM	n/a	NA	170	NA	NA	NA	NA
VANADIUM	n/a	NA	26	--	33	--	--
ZINC	[5,000]	NA	52	--	32	--	10
<b>ORGANICS</b>							
ALL	n/a	NA	--	NA	NA	NA	NA
<b>PESTICIDES/PCBs</b>							
ALL	n/a	NA	--	--	--	--	--

Notes:

ARAR = Applicable or Relevant and Appropriate Requirements

All ARARs are the Drinking Water Standard Maximum Contaminant Level, November, 1991, except for values in [ ]

[ ] = ARAR is the Clean Water Act Ambient Water Quality Criteria for Water and Aquatic Life.

n/a = MCL not available

Shaded values indicate the ARAR was exceeded

\* = MCL Action Level

J = estimated value

-- = not detected

NA = not analyzed

All concentrations are in µg/l

CONCENTRATION OF CHROMIUM IN MW-003  
GALLAWAY PONDS SITE  
GALLAWAY, TN

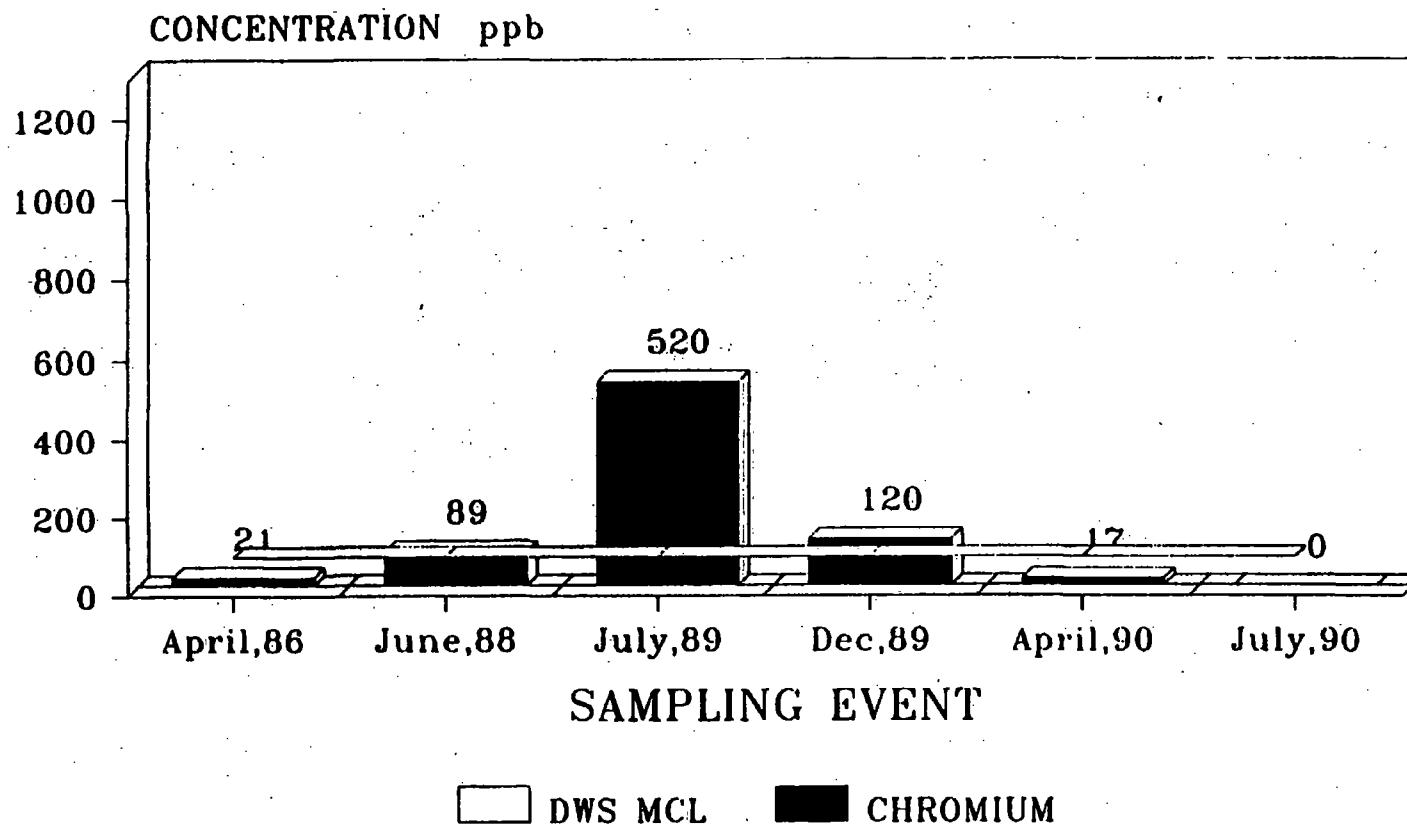


FIGURE B.1

B-1

CONCENTRATION OF NICKEL IN MW-003  
GALLAWAY PONDS SITE  
GALLAWAY, TN

B-2

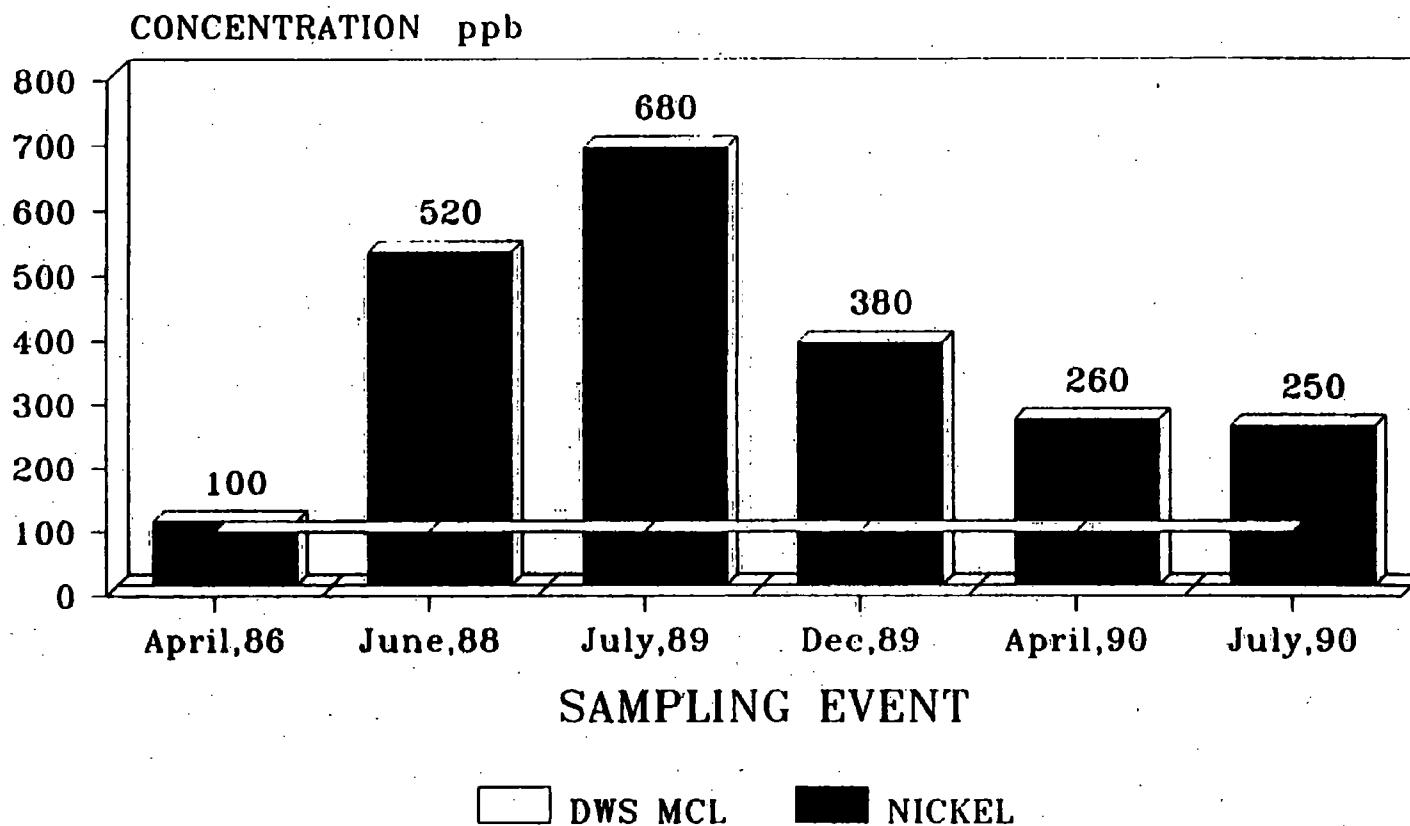


FIGURE B.2

CONCENTRATION OF CHROMIUM IN MW-004  
GALLAWAY PONDS SITE  
GALLAWAY, TN

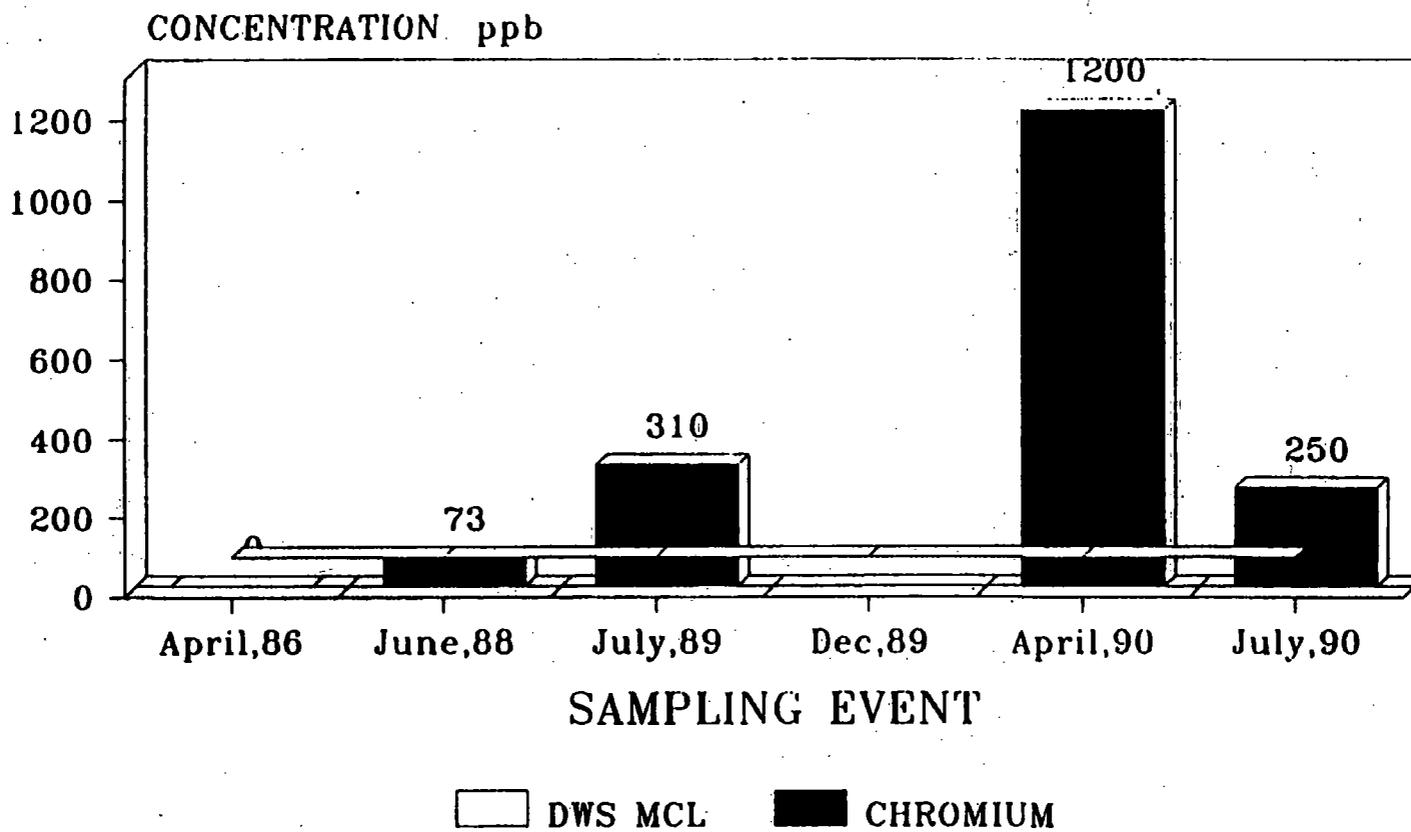


FIGURE B.3

CONCENTRATION OF NICKEL IN MW-004  
GALLAWAY PONDS SITE  
GALLAWAY, TN

B-4

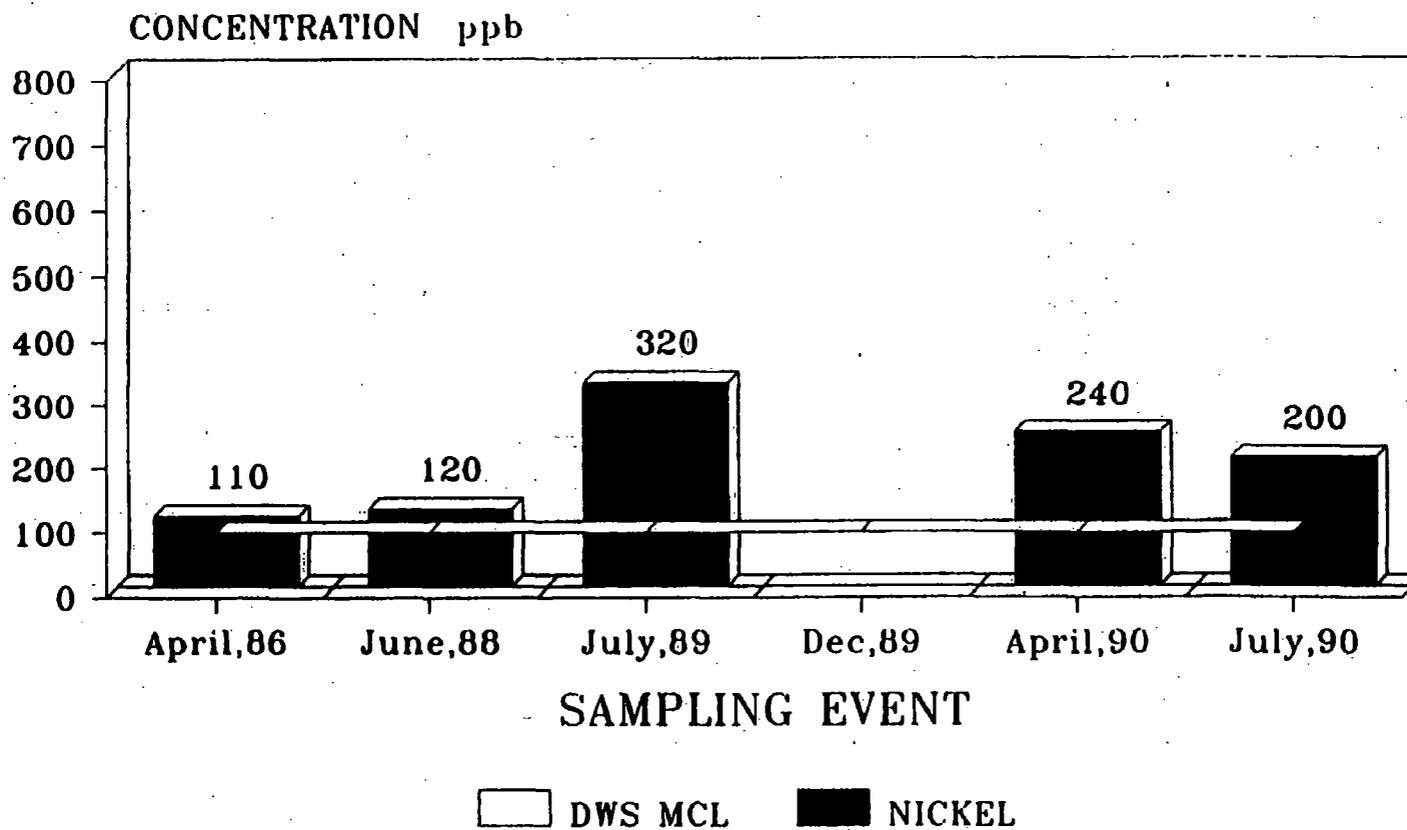


FIGURE B.4

CONCENTRATION OF NICKEL IN MW-009A  
GALLAWAY PONDS SITE  
GALLAWAY, TN

B-5

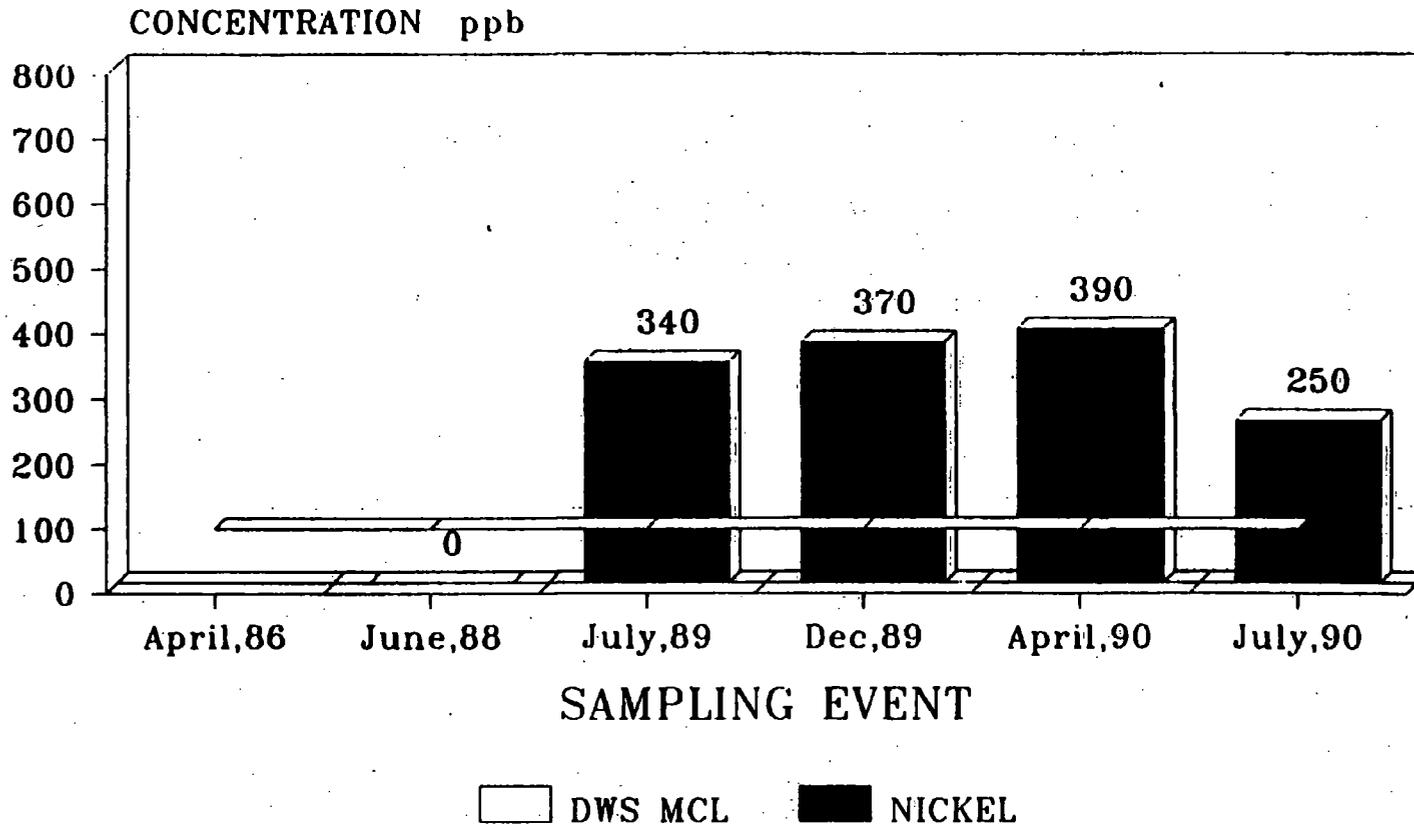


FIGURE B.5

CONCENTRATION OF CHROMIUM IN MW-009B  
GALLAWAY PONDS SITE  
GALLAWAY, TN

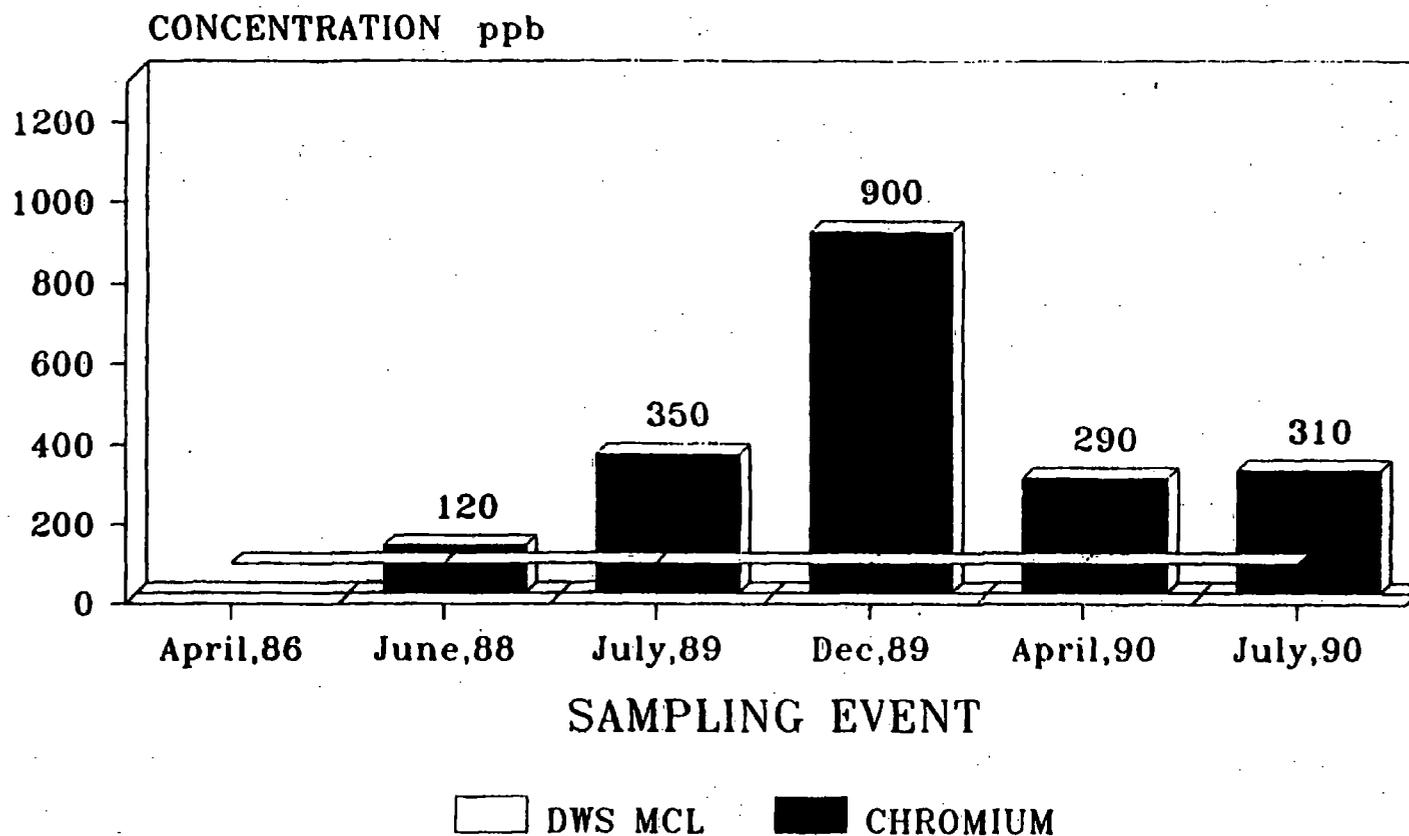


FIGURE B.6

B-6

CONCENTRATION OF NICKEL IN MW-009B  
GALLAWAY PONDS SITE  
GALLAWAY, TN

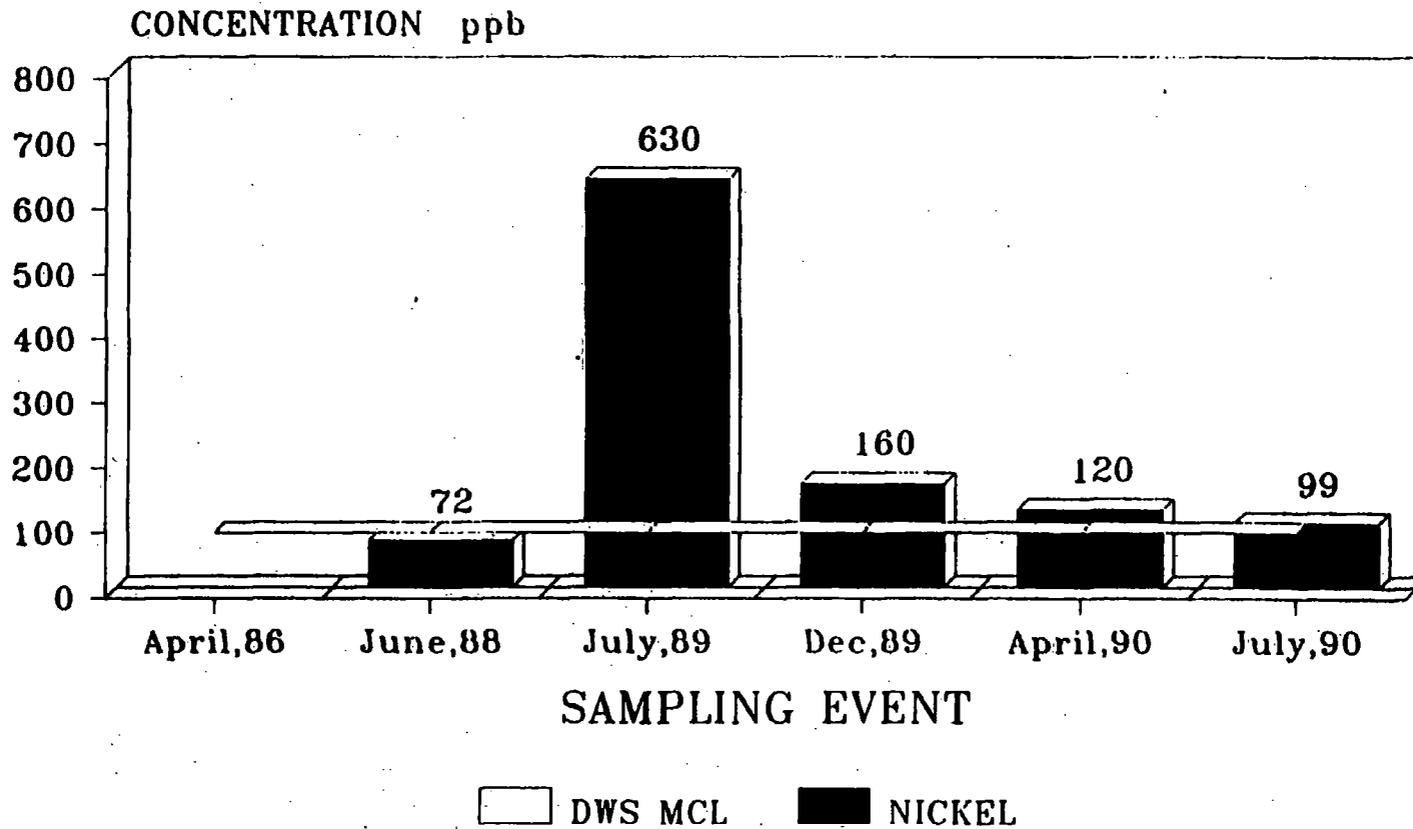


FIGURE B.7

B-7



Environmental  
Science &  
Engineering, Inc.

Recy  
6/7/90 5-1

Called MCK  
Monday aft.

RECEIVED  
JUN 22 1990  
*D.P. Knight*  
*cc: file*  
*TKD*

4236.772

June 5, 1990  
ESE No. 3905002000-0100

Ms. Karen Knight  
EBASCO Services Incorporated  
145 Technology Park  
Norcross, Georgia 30092-2979

RE: REM III - EPA CONTRACT NUMBER 68-01-7250; W.A. NO. 282-4BL3  
GALLAWAY PONDS; EROSION CONTROL AND STABILIZATION PLAN

Dear Karen:

ESE is pleased to submit this preliminary Erosion Control and Stabilization Plan and construction cost estimate for the Gallaway Ponds site as discussed in the ESE letter to Mike Szomjassy of November 6, 1989. A topographic survey of the Gallaway Ponds site was requested by ESE and completed for EBASCO Services Inc. by Professional Land Services on January 17, 1990. The survey was necessary to effectively evaluate alternatives for the offsite erosion problems and prepare these plans. As discussed in the November 6 letter the recommended alternative to resolve ponding water in the perimeter drainage ditch is to regrade the entire drainage ditch to a uniform gradient (1 percent slope). Erosion occurring outside the perimeter drainage ditch is due to a combination of: (1) steep slopes, (2) poor vegetation, and (3) non-cohesive soil properties. The Erosion and Stabilization Plan is designed to correct and prevent onsite erosion problems for the 30-year post closure period. Based on our engineering judgement, this alternative provides the greatest degree of stability, is the most effective, and is the most economical considering O&M expense.

An estimate of the earthwork required to restore the perimeter drainage ditch and regrade the offsite erosion areas is 45 cubic yards (cy) and 2,230 cy, respectively. A construction cost estimate to remediate the perimeter drainage ditch is \$15,000. The cost of the offsite erosion areas is dependant upon the method of erosion control selected. Therefore, based on labor, equipment and materials, and a 10 percent contingency, the total estimated construction cost for this Erosion Control and Stabilization Plan is \$97,300.

The preliminary Erosion Control and Stabilization Plan incorporates a geogrid erosion control material to be placed on the regraded side slopes (see Drawing No.5). This material is used in some situations to provide additional slope stability by networking the root systems with the geogrid material. However, after a value engineering review

Ms. Karen Knight  
June 5, 1990  
Page 2

of this design we recommend deleting the geogrid erosion control fabric from the design. Our final review indicates that the site conditions do not justify the additional expense (\$28,400). If you agree with this we will delete the geogrid fabric from the final plans to be provided after we receive your review comments. The total estimated construction costs for the proposed design (excluding the geogrid) is \$66,000.

Please forward a copy of this letter to Mr. Derek Matory at EPA. If you have any questions or comments regarding this preliminary plan, please feel free to contact me or Mr. Bob Roberts at (904) 332-3318.

Sincerely,

*Mike McKinney rkr*

Mike McKinney  
Project Manager

MM/rkr

Enclosures

cc: Derek Matory - EPA, Region IV  
Bob Roberts - ESE  
John Byroade (ESE Washington, DC)

TABLE 1 Construction Cost Estimate

CONSTRUCTION COST ESTIMATE	Date Prepared: 07/06/90	Sheet 1 of 2
Project: Galloway Ponds Site	Calculated By: <u>ACE</u> Date: <u>7-1-90</u>	
Location: Galloway, Tennessee		
A/E: ESE (3905002000-0100-3130)		

Drawing No. \_\_\_\_\_ Checked By: QCT 7-6-90

Item No.	Description	Quantity		Labor		Equipment		Material		TOTAL COST
		No. Units	Unit Meas	Per Unit	Total	Per Unit	Total	Per Unit	Total	
PROJECT SUMMARY										
1.	PERIMETER DRAINAGE DITCH									
1.	Mob/Demobilization	1	ea	3,000.00	\$3,000.00	----	-----	-----	-----	\$3,000
1a.	Remove & Salvage Fence	820	lf	1.22	\$1,000.40	0.48	\$393.60	-----	-----	\$1,394
1b.	Survey & layout	1	ea	1,290.00	\$1,290.00	----	-----	-----	-----	\$1,290
2.	Regrade Ditch									
2a.	Remove Riprap	290	cy	3.14	\$910.60	1.57	\$455.30	-----	-----	\$1,366
	Cut & Stake Filter Fabric	3,520	sf	0.01	\$40.83	----	-----	0.02	\$56.32	\$97
	Regrade ditch	45	cy	14.06	\$632.70	7.56	\$340.20	-----	-----	\$973
2d.	Compact Clay	200	sy	0.25	\$50.40	1.06	\$211.60	-----	-----	\$262
2e.	Replace Filter Fabric	3,520	sf	0.02	\$80.96	----	-----	0.19	\$651.20	\$732
2f.	Perform Centerline Survey of Entire Perimeter Ditch	1	ea	750.00	\$750.00	----	-----	-----	-----	\$750
2g.	Replace Riprap	140	cy	8.21	\$1,149.40	3.25	\$455.00	-----	-----	\$1,604
3.	Outfall Channel									
3a.	Earthwork	95	cy	4.26	\$404.70	3.97	\$377.15	-----	-----	\$782
3b.	Filter Fabric	1450	sf	0.02	\$33.35	----	-----	0.09	\$133.40	\$167
3c.	Const. Drainage Outfall	1450	sf	0.63	\$907.70	1.55	\$2,247.50	1.32	\$1,914.00	\$5,069
3d.	Place Riprap	20	cy	30.24	\$604.80	7.94	\$158.80	7.50	\$150.00	\$914
4.	RCRA Cap Access Ramp									
4a.	Earthwork	4	cy	4.26	\$17.04	3.97	\$15.88	-----	-----	\$33
4b.	Sod Ramp	275	sf	1.10	\$302.50	----	-----	0.90	\$247.50	\$550

SUB-TOTAL PAGE 1 = \$18,983

TABLE 1 Construction Cost Estimate

CONSTRUCTION COST ESTIMATE	Date Prepared: 07/06/90	Sheet 2 of 2
Project: Gallaway Ponds Site Location: Gallaway, Tennessee A/E: ESE (3905002000-0100-3130)	Calculated By: <u>ZZ</u> Date: <u>7-1-90</u>	

Drawing No. \_\_\_\_\_ Checked By: J.C.J. 7-6-90

Item No.	Description PROJECT SUMMARY	Quantity		Labor		Equipment		Material		TOTAL COST
		No. Units	Unit Meas	Per Unit	Total	Per Unit	Total	Per Unit	Total	
II.	REGRAIDING & STABILIZATION									
5.	Erosion Control									
5a.	Clearing and Grubbing	8,365	sy	0.08	\$669.20	0.18	\$1,505.70	-----	-----	\$2,175
5b.	Regrade & Compact Site	2,230	cy	0.67	\$1,494.10	1.36	\$3,032.80	-----	-----	\$4,527
5c.	Topsoil (3 Inches)	700	cy	0.53	\$371.00	0.56	\$392.00	4.00	\$2,800.00	\$3,563
5d.	Install Silt Fence	1,315	lf	0.50	\$657.50	-----	-----	0.60	\$789.00	\$1,447
5e.	Sod with Bermuda grass	8,365	sy	1.10	\$9,201.50	-----	-----	0.90	\$7,528.50	\$16,730
	Reinstall Salvaged Fence	820	lf	6.30	\$5,166.00	-----	-----	-----	-----	\$5,166
5g.	Final Topographic Survey	1	ea	\$2,000.00	\$2,000.00	-----	-----	-----	-----	\$2,000
III.	OPERATION AND MAINTENANCE									
6a.	Weekly Water and Mowing	8	ea	200.00	\$1,600.00	-----	-----	-----	-----	\$1,600
6b.	Quarterly Fertilizing	4	ea	500.00	\$2,000.00	-----	-----	-----	-----	\$2,000

SUB-TOTAL PAGE 2 = \$39,207  
 SUB-TOTAL PAGE 1 = \$18,983  
 TOTAL = \$58,190  
 TOTAL = \$64,009

Contingency (10%)

**APPENDIX D**

**SITE TRIP REPORT**

**SITE TRIP REPORT  
FOR THE  
GALLAWAY PONDS SITE  
GALLAWAY, TENNESSEE**

*(Contract No. 68-W9-0029)  
Work Assignment C04021D*

*Submitted to:*



**U. S. ENVIRONMENTAL PROTECTION AGENCY  
REGION IV**

*January 29, 1992*

*Submitted by:*



**RESOURCE APPLICATIONS, INC.**

*Engineers • Scientists • Planners*

*1000 Cambridge Square, Ste.D*

*Alpharetta, GA 30201*

*(404) 664-3618*

## Galloway Ponds Site Visit Report

The activities that took place during RAI's visit to the Galloway Ponds site in Galloway, Tennessee are listed in chronological order below:

Tuesday, December 17, 1991 :

-RAI mobilized to the site from Memphis, Tennessee.

-A brief visual site inspection was performed, and an attempt was made to locate all of the groundwater monitoring wells and all other facilities.

-Progress was near completion toward mowing and other miscellaneous maintenance work. Mechanized mowing operations had been completed and final hand work was underway. Repairs were being completed to the drive where slight erosion had occurred.

-Weather: clear, mild, approx. 50° to 60°F

-Personnel:       B. Thomas Hancher, P.E. (RAI)  
                  Derek Matory, RPM (EPA)  
                  Tenn Dept Envir. & Conservation  
                  -Floyd Heflin, Env. Engr.  
                  -Coleen Powers, Memphis Fld. Off.  
                  -Jordan English, Geologist

-A more detailed visual inspection of the site was performed. The site seemed to be in good condition except for some sign of standing water at the southern corner of the berm ditch.

-The 100 ft. exclusion is lacking on the S.W. side of the site. The subject inspection occurred after rainy period and the groundwater in all surrounding impoundments was high, encroaching upon the 100 ft. exclusion.

-The noticeable high water and from a review of plans for the site indicate the waste cells are below, in depth, the high water observed during this inspection. No land surveying was performed to verify these observations.

-The engineering plans for improvements to the surface site conditions were, apparently never constructed. The maintenance of facilities were not encumbered by the existing improvements; tractor climbing slopes to cut grass was accomplished without damage to slopes, however precautions were used to maneuver the steep slope.

-The location of the groundwater and gas vents were confirmed. All wells appeared to be in good condition. No sampling was to be performed during this phase of work.

-The stone (rip rap) protection of surfaces provides adequate protection and no slope erosion was observed.

- Photographs were taken of the site from both closeup and panoramic perspectives.

REPORT OF FIELD OBSERVATION  
GALLAWAY PONDS, GALLAWAY, TENNESSEE

Observation Report No: 1 Date of Observation: 12-17-91  
 Time Arrived Onsite: 10:00 AM Time Departed Site: 3:30 PM  
 Field Personnel: EPA: Mr. D. Vatory; TN: Mr. F. Heflin, M.S.C. Powers, Mr. J. English

Section A: Topsoil/Grass Cover	Yes*	No	Not Observed	Comment No.
1. Minor settlement of cover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
2. Major settlement of cover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
3. Evidence of erosion, swales cracks, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
4. Damage to gas vent pipes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
5. Inadequate growth of grass cover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
6. Pondered water on cover	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
7. Grass height greater than 6 inches	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1</u>

Section B: Perimeter Drainage Ditch System	Yes*	No	Not Observed	Comment No.
1. Sloughing, erosion or vegetation on ditch side slopes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
2. Vegetation growth in ditch channel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2</u>
3. Pondered water, impairment of flow, sedimentation in ditch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3</u>
4. Erosion control fabric exposed or ripped	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----

Section C: Monitoring Wells	Yes*	No	Not Observed	Comment No.
1. Wells locked	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-----
2. Guard posts missing or damaged	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
3. Protective casing missing or damaged	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
4. Concrete pads damaged or cracked	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
5. Possible surface water infiltration into wells	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----

Section D: Security Fence	Yes*	No	Not Observed	Comment No.
1. Holes in fence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
2. Structural problems with fence or gate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3</u>
3. Gate unlocked	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
4. Broken or missing lock	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----

Section E: Exclusion Zone	Yes*	No	Not Observed	Comment No.
1. 100 foot width maintained	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>4</u>
2. Vegetation higher than 2 feet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>5</u>
3. Trees or bushes growing in zone	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
4. Sloughing or erosion of slopes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----

Section F: Access Road	Yes*	No	Not Observed	Comment No.
1. Site inaccessible due to mining activities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-----
2. Site inaccessible due to road conditions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6</u>

\*If yes, assign a comment no. in the last column and see page 2 for instructions.

Signature of Observer: Robert M. Barlow Date: 12/18/91  
 ESEB7 1/21/92

REPORT OF FIELD OBSERVATION

GALLAWAY PONDS, GALLAWAY, TENNESSEE

Observation Report No: 1

Date of Observation: 12/17/91

Instruction: If any item is checked yes, provide details of the problem and maintenance recommendations below and indicate the location deficiency on the site map on page 3.

Comment No:

Comment

1

Mowing operation completed during this observation date

2

See photo GP 9

3

Gate post settlement opened gap in gate closure; chain secured closure; opening would permit small child entry

4

see photo GP 6; high water inundates 100' perimeter

5

see photo GP 5; grass cut to ~~50'~~ 30' limit

Comment No.

Corrective Action Performed:

6

~~Correct~~ road fill repair performed

Signature of Observer: B. J. Smith, Van C.  
E587

Date: 12/18/91  
1/22/92

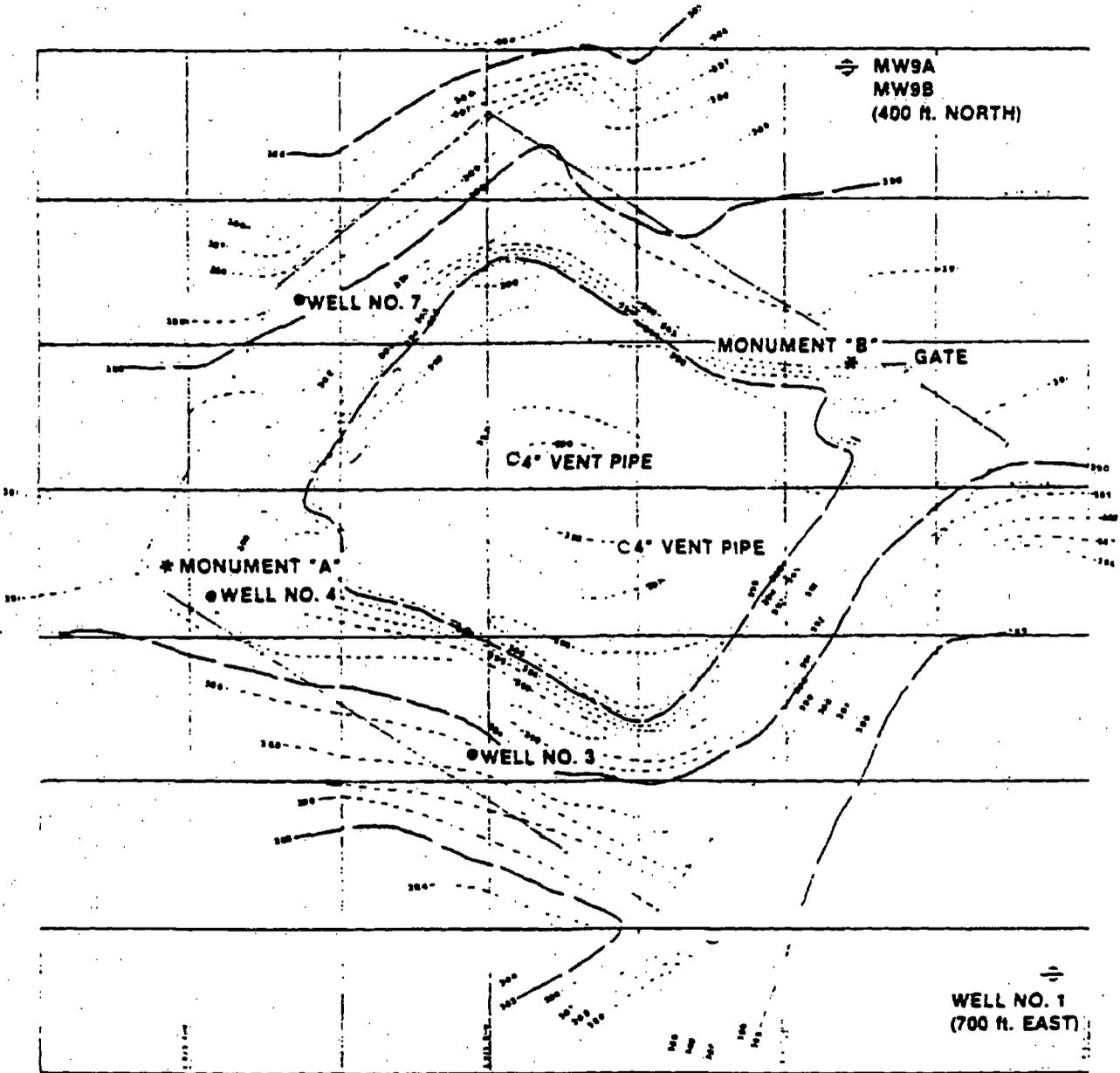
REPORT OF FIELD OBSERVATION

GALLAWAY PONDS, GALLAWAY, TENNESSEE

Observation Report No:       L      

Date of Observation: 12/17/91

Site Map



SCALE

25 0 25 50 FEET



Signature of Observer: [Handwritten Signature]  
E5887

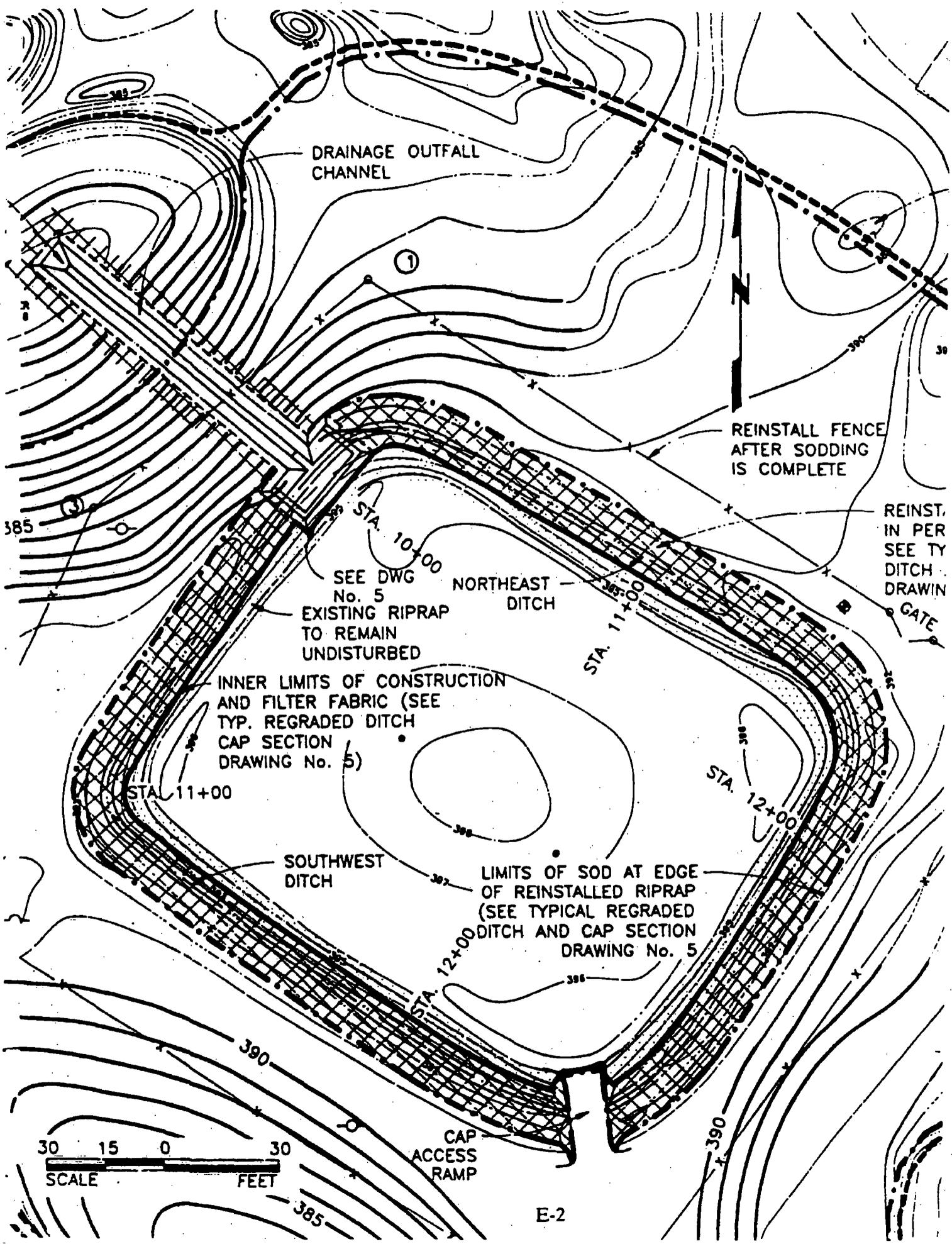
Date: 12/18/91

Page 3

The cross sections in this appendix were copied from a set of plans prepared for the U.S. EPA, for the Gallaway Ponds Site, by Environmental Science and Engineering, Inc., Gainesville Florida, dated July 1990.

## LEGEND

③	FENCE CORNER LOCATION AND IDENTIFICATION NUMBER
◆	BENCHMARK
○	MONITOR WELL
•	VENT PIPE
— x —	PERIMETER FENCE
—▶	SLOPE - FILL
—◀	SLOPE - CUT
—	EXISTING CONTOUR
365 —	NEW CONTOUR
— — —	PERIMETER DRAINAGE DITCH
— X X X —	RIPRAP TO BE REINSTALLED
— . . . —	EXTENT OF EXISTING RIPRAP
— • • • —	LIMITS OF SODDING
— - - - -	SILT FENCE/ OUTER LIMITS OF CONSTRUCTION
— — — — —	INNER LIMITS OF CONSTRUCTION



DRAINAGE OUTFALL CHANNEL

REINSTALL FENCE AFTER SODDING IS COMPLETE

REINST. IN PER SEE TY DITCH DRAWIN

GATE

SEE DWG No. 5  
EXISTING RIPRAP TO REMAIN UNDISTURBED

NORTHEAST DITCH

INNER LIMITS OF CONSTRUCTION AND FILTER FABRIC (SEE TYP. REGRADED DITCH CAP SECTION DRAWING No. 5)

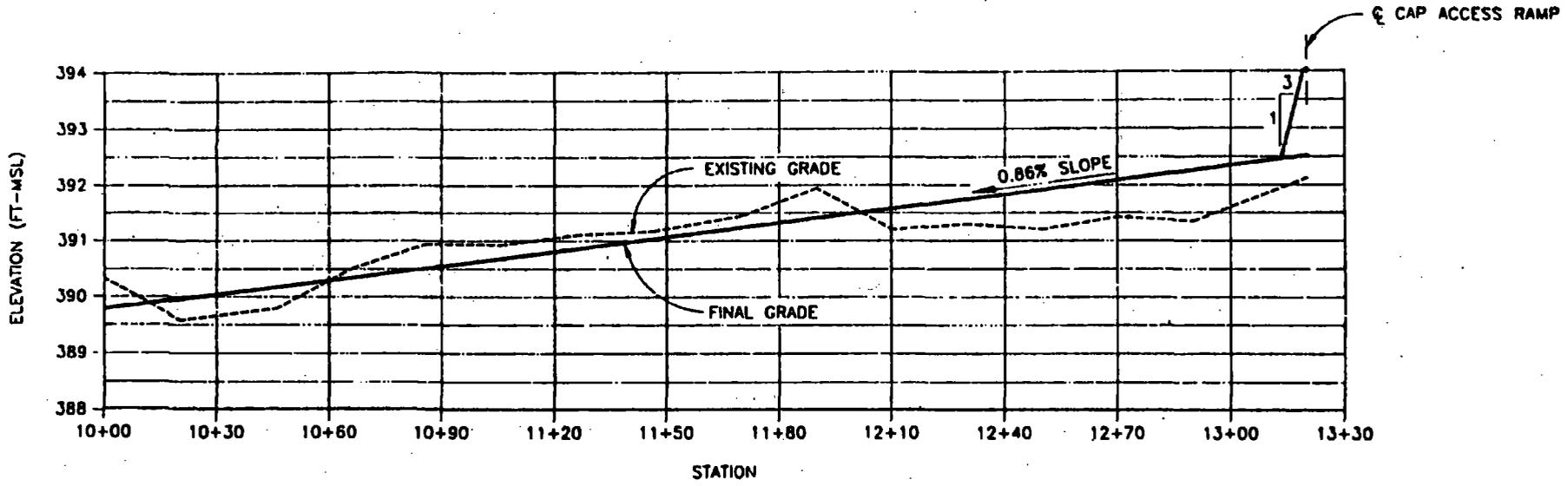
LIMITS OF SOD AT EDGE OF REINSTALLED RIPRAP (SEE TYPICAL REGRADED DITCH AND CAP SECTION DRAWING No. 5)

SOUTHWEST DITCH

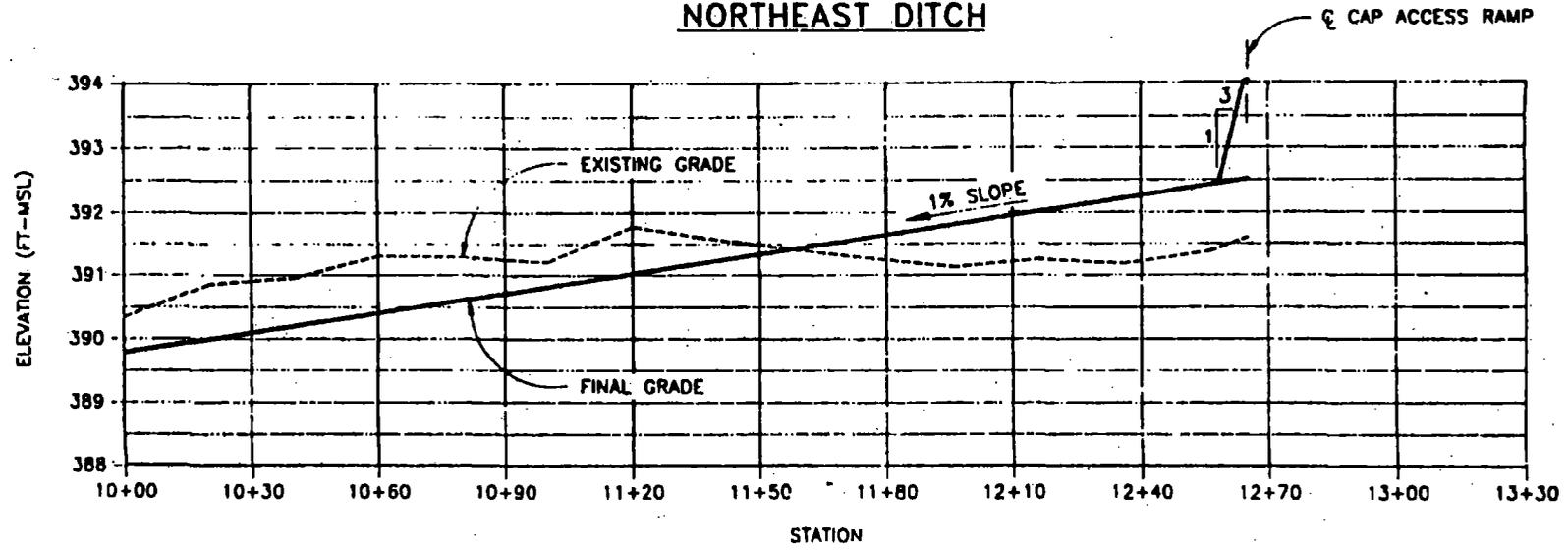
CAP ACCESS RAMP

30 15 0 30  
SCALE FEET

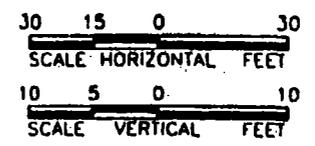
E-2



**DRAINAGE DITCH PROFILE  
NORTHEAST DITCH**



**DRAINAGE DITCH PROFILE  
SOUTHWEST DITCH**



E-3

Table 6-1. Estimated Costs for Implementing Operations and Maintenance Plan  
Operations and Maintenance Plan, Galloway Pond, Galloway, TN

ACTIVITY	No. of persons per trip	No. of trips per year	Labor hours per trip	Labor rate (\$/hr.)	Vehicle rate (\$/day)	No. of Analytical Samples	Cost per Analytical Sample	Fixed Costs	Cost per Trip (\$)	Annual Cost (\$)	Response Period (months)	Total Cost (\$)
<b>A. FACILITY OBSERVATIONS, SAMPLING AND ANALYSIS</b>												
Facility Observations	2	4	10	\$15	\$25			\$0	\$325	\$1,300	0	\$1,300
Observation Report	1	4	12	\$15				\$100	\$780	\$1,120	0	\$1,120
Ground water												
Sampling (IAHS 1)	2	4	12	\$15	\$25			\$200	\$585	\$2,340	1	\$2,340
Analysis (IAHS 1)						6	\$195	\$200	\$3,170	\$1,300	1	\$1,300
Sampling (IAHS 6-20)	2	4	12	\$15	\$25			\$200	\$585	\$2,340	1	\$2,340
Analysis (IAHS 6-20)						6	\$195	\$200	\$3,170	\$1,300	1	\$1,300
<b>B. ROUTINE MAINTENANCE ACTIVITIES (quarterly basis)</b>												
Grass Cover Mowing	2	4	4	\$15	\$25			\$50	\$195	\$780	0	\$780
Exclusion Zone Mowing	2	4	8	\$15	\$25			\$50	\$315	\$1,260	0	\$1,260
Weed and Tree Control	1	1	4	\$15	\$25			\$100	\$185	\$185	0	\$185
Topographic Survey		1	1					\$1,500	\$1,500	\$1,500	0	\$1,500
Soil pH and nutrient test	1	1	1	\$15	\$25			\$50	\$90	\$90	0	\$90
<b>C. NON-ROUTINE MAINTENANCE ACTIVITIES (as deemed necessary)</b>												
Minor Settlement of Cover or Ditch	2	1	8	\$15	\$50			\$100	\$390	\$390	0	\$11,700
Erosion Control (cover, ditch, berms, exclusion zone)	3	2	8	\$15	\$50			\$200	\$610	\$1,220	0	\$6,600
Gas Vent System	1	1	8	\$15	\$25			\$100	\$245	\$245	0	\$7,350
Monitor Wells	2	1	8	\$15	\$25			\$100	\$365	\$365	0	\$10,950
Security Fence	2	1	8	\$15	\$25			\$200	\$465	\$465	0	\$13,950
Access Road	2	1	8	\$25	\$120			\$350	\$870	\$870	0	\$26,100
Grass reseeding	1	1	8	\$15	\$25			\$50	\$195	\$195	0	\$5,850

Source: ESE, 1987.

TOTAL \$191,100

NOTES: 1. THE ESTIMATED COSTS IN THIS TABLE REPRESENT 1987 DOLLARS

**APPENDIX F**

**PHOTOGRAPHS**



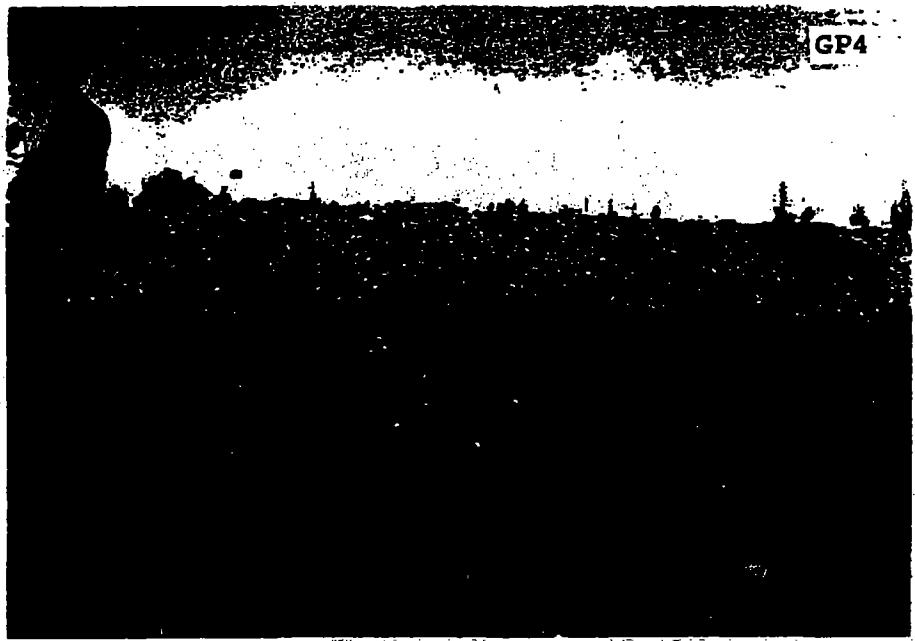
At the southern corner of the site looking northeast.



At the southern corner of the site looking northwest.



On the eastern edge of the site looking west.



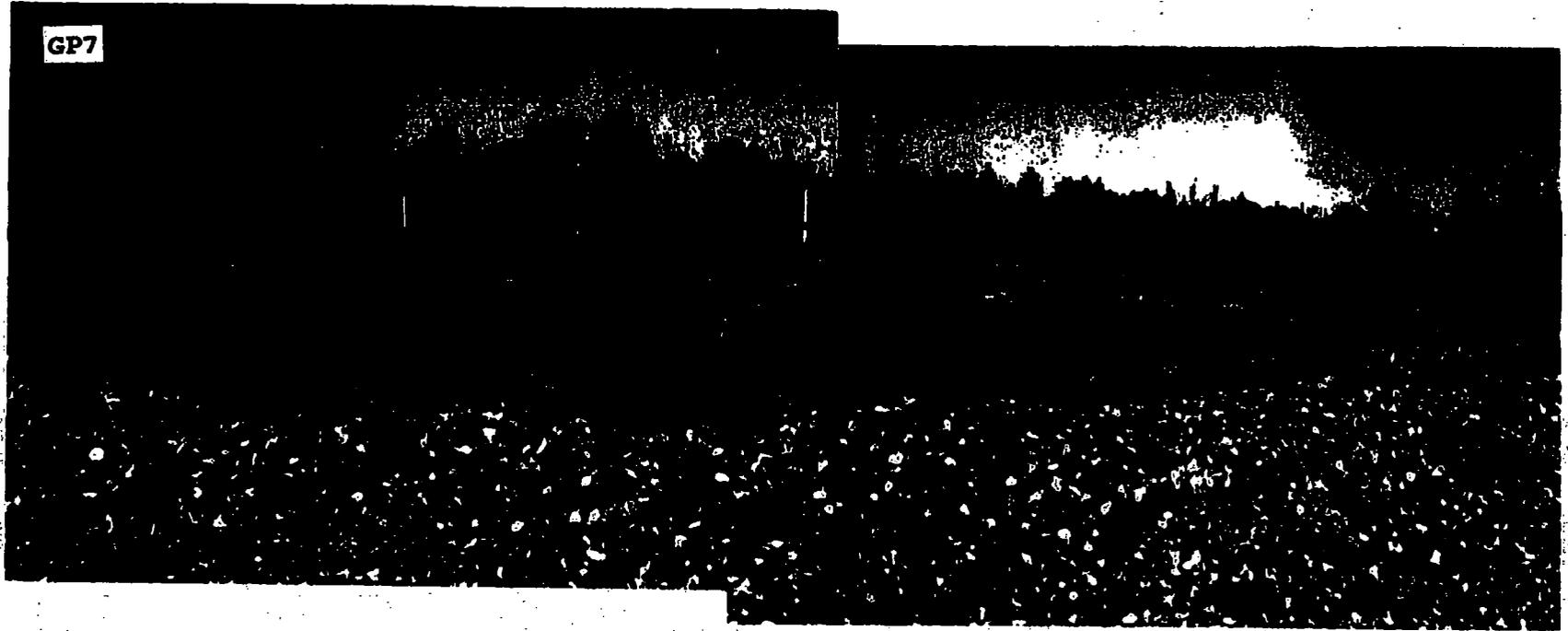
On the eastern edge of the site looking northwest.



At the southern corner of the site looking northwest at MW3.



At the southern corner of the site looking west at an offsite pond.



Composite photo taken at the southern corner of the site looking north at the cap. Note the worker maintaining the site, the good condition of the rip rap, and the establishment of vegetation on the cap.

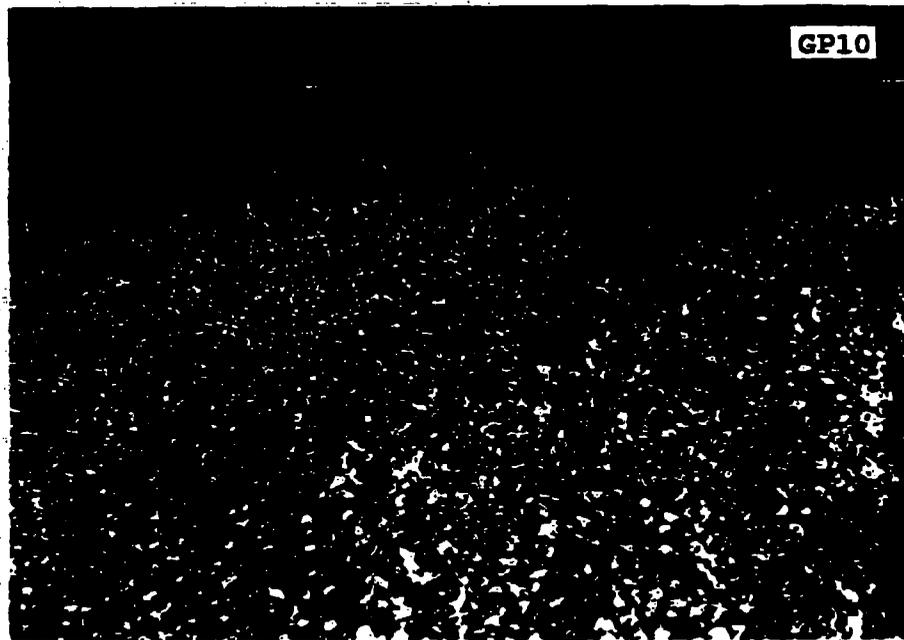


Composite photo taken from the entrance to the site off of  
State Route 393 looking northwest.

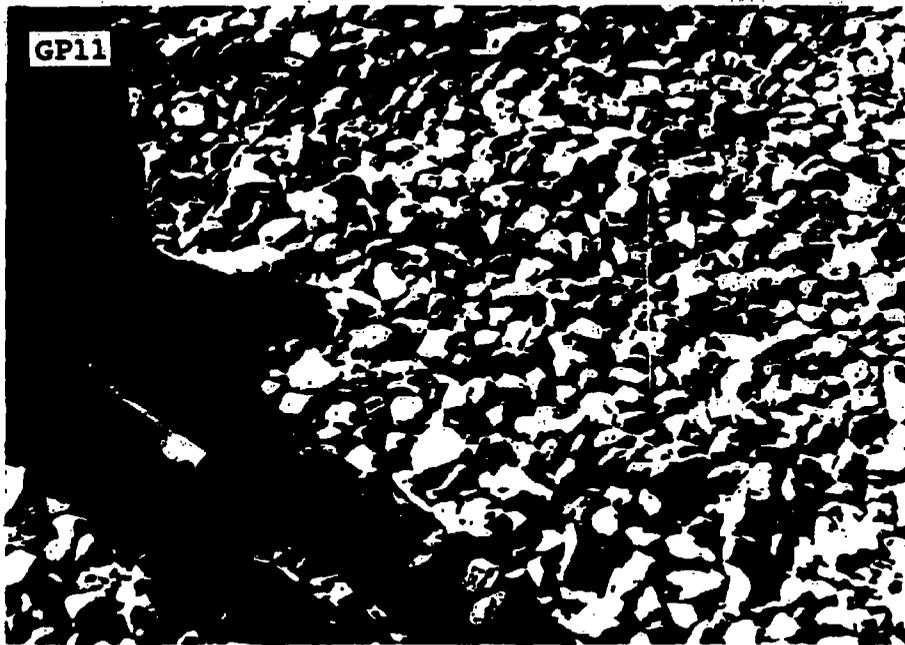
Callaway Ponds



Standing on top of the cap at the south corner looking southwest at some ponded water that has collected in the drainage ditch. Note MW3 in the background.



Standing on top of the north corner of the cap looking north. Note there is no vegetation growing in the rip rap and there is no sloughing of the rip rap.



Standing near the northern corner of the cap, just outside of the fence, showing a closeup of the rip rap. Note there is no vegetation or sloughing.



Standing on State Route 393 northeast of the site looking southwest at the cap.



Standing on State Route 393 northeast of the site looking southwest at an offsite pond.



Standing on State Route 393 northeast of the site looking southwest at the cap.

**APPENDIX C**

**Close - Out Report – July 19, 1995**

Galloway Pits  
8.2  
DD copy

20359

CLOSE-OUT REPORT  
GALLOWAY PITS SITE  
GALLOWAY, TENNESSEE

I. INTRODUCTION

This Final Close-Out Report documents that the U.S. Environmental Protection Agency (EPA) has completed all remedial activities for the Galloway Pits site (the "Site"), Fayette County, Tennessee in accordance with procedures for Completion and Deletion of National Priorities List sites and Update (OSWER Directive 9320.2-3C). Additionally, the report provides a brief technical justification for deletion of the Site from the National Priorities List (NPL). The U.S. Environmental Protection Agency, Region IV, and the Tennessee Department of Environment and Conservation (TDEC) have reviewed and evaluated all remedial activities performed at the Site, and the remedial activities met the cleanup criteria outlined in the Record of Decision (ROD). Following the approval of this Close-Out Report, Galloway Pits will be classified as a deletion candidate.

The Final Close-Out Report will address site conditions, quality assurance and quality control during construction, operation and maintenance, and the technical criteria for deletion.

II. SUMMARY OF SITE CONDITIONS

a. Background

The Galloway Pits Site (five-acres) was extensively mined for sand and gravel, producing a landscape dotted with water-filled pits up to 50 feet deep. Some of the pits have been used for disposal of liquid and solid waste (mainly pesticide or pesticide residues), glass jars and drums. The site was proposed for inclusion on the National Priorities List (NPL) in December 1982 and appeared on the final NPL in September 1983. The primary factor contributing to the site being on the NPL was the potential for groundwater contamination. Preliminary sampling of the pond water and sediments showed elevated levels of pesticides (i.e. chlordane, endrin, and lindane). The groundwater samples did not reveal any contamination; however, potential existed for groundwater contamination because of the types and quantities of waste at the site. Finally, run off from the site threatened off-site biota.

In October 1983, the EPA conducted an emergency cleanup. The cleanup consisted of the excavation and off-site disposal of contaminated sludge and the on-site treatment of the pond water. The treatment process involved the carbon filtration of the pond water to limits established by the Tennessee Department of Health

and Environment (TDHE), Division of Water Quality Control.

In February 1984, EPA obligated funds to conduct a Remedial Investigation/Feasibility Study (RI/FS). NUS Corporation was tasked to perform the RI/FS. Based on extensive discussions with the EPA On-Scene Coordinator for the federal cleanup action and a review of site background data, it was determined that a focused RI would be appropriate for this site. The focused Remedial Investigation Report was finalized in April 1986. The draft Feasibility Study was completed in June 1986 and finalized in September 1986. The public comment period ended on August 12, 1986.

#### b. Focused Remedial Investigation Results

The focused Remedial Investigation Report included a sampling program for each of the potentially affected environmental media: surface water, sediment, surface soils, and groundwater. The following sections describe the results of this investigation:

##### 1. On-Site Surface Water/Sediment (Ponds 1-9)

Contaminants detected in the surface waters of Ponds 1, 2, 5, 8, and 9 exceeded the acute Ambient Water Quality Criteria (AWQC) for the following parameters: Pond 1 - chlordane, Pond 2 - toxaphene, Pond 5 - cadmium, Pond 8 - arsenic, and Pond 9 - cadmium.

Chronic AWQC limits were exceeded in Ponds 1, 2, 3, 4, 8, and 9 for pesticides and in Ponds 5, 8, and 9 for inorganics. These contaminant levels were high enough to be harmful to aquatic life and probably precluded the presence of many sensitive species in the ponds.

The sediment in Ponds 1, 2, 3, 4, 8, and 9 showed pesticide contamination. Chlordane was the most prevalent contaminant, with a few occurrences of dieldrin and toxaphene. The sediment in Pond 7 contained cadmium above background levels, while Ponds 8 and 9 contained elevated levels of arsenic.

##### 2. On-Site Surface Soils

Chlordane was detected in the surface soils around the northern half of Pond 1 and between Ponds 1 and 9. Arsenic and cadmium were also detected in the surface soils. Similar levels of arsenic were detected over much of the site; however, arsenic was detected in two background locations and therefore may not be site-related. Cadmium was detected in a sample located west of Pond 1, which was the same sample that contained the highest chlordane value. Cadmium was also detected in a sample that was located between Ponds 1 and 3.

### 3. On-Site Subsurface Soil/Groundwater

No pesticides were detected in the subsurface soil sample located west of Pond 1. Samples were collected at 5-foot intervals from a depth of 5 feet to a depth of 52 feet. As a class, pesticides have low mobility and, therefore, are unlikely to migrate to any great depth. Chloroform, a common laboratory solvent, was estimated to be present at very low levels (less than the contract-required detection limit) in the upper 10 feet of the boring. Other volatiles, which were not found elsewhere on-site, were found in the deepest subsurface sample at a depth of 51 feet. This sample was collected from within the top of the Jackson Clay Formation. Cadmium was also present in this sample.

#### c. Risk Assessment

A quantitative risk assessment was performed for various contaminant exposure pathways. Risks for the exposure pathways were calculated for the site for the conditions of both mining and no mining. Based on the available data and risk assessment assumptions, the exposure pathways presented no unacceptable risks to human receptors. The only unacceptable risk presented by the Site was the potential risk to off-site biota that could occur if Ponds 1, 2, or 5 would overflow to off-site tributaries.

#### d. Record of Decision Finding

The Record of Decision (ROD) outlined the following selected remedial actions:

Dilution of water in Ponds 1, 2, and 5 with city water to meet Ambient Water Quality Criteria and subsequent discharge to an unnamed tributary of Cane Creek;

Excavation of contaminated sediments from Ponds 2 and 5, and consolidation of these sediments in Pond 1;

Institutional controls, such as fencing around Pond 1, restriction on mining, and methods to ensure that future land uses are compatible with the selected remedy;

Proper site closure under Subtitle C of RCRA, including capping of Pond 1;

Operation and Maintenance (O&M) activities that include groundwater monitoring inspection and maintenance of cap.

#### e. Design Criteria

The EBASCO Services, Inc. was tasked to perform a Remedial Design for the selected actions recommended by the ROD at the Site. Listed below are the design criteria:

- Determine a kiln dust/sediment ratio for the solidification process;
- Determine the below grade excavation configuration of Pond 1 to store the solidified waste;
- Design a RCRA cap over the below grade configuration;
- Determine the safety factor against bearing capacity failure of foundation soils underlying the solidified waste and RCRA cap; Perform an effective analysis of foundation soils to check for possible detrimental settlement of RCRA cap;
- Design a gas recovery system based on the characteristics of the known contaminants and the solidification process;
- Design a drainage ditch system to collect and route runoff away from the RCRA cap;
- Provide performance specifications for construction of the cap and guidelines for testing and observations;
- Determine a revised above grade configuration based on the actual volume of solidified waste placed in Pond 1.

#### f. Construction Activities Performed

Construction activities were initiated in June 1987 at the site. These activities are described below:

##### Phase 1 - Pond Water Sampling

Prior to beginning the Removal Action, surface water and sediment samples were collected for chemical analysis and bioassay tests to determine the current-level of contamination in Ponds 1, 2, and 5. Based on the analytical results, EPA concluded that on-site treatment was not required prior to discharge and that the water could be released directly to an unnamed tributary of Cane Creek without stressing natural biota.

##### Phase 2 - Water Evacuation of Ponds 1, 2, and 5

Water was evacuated from Ponds 1, 2, and 5 using high velocity pumps to a nearby tributary. In addition, trees and brush were cleared from the pond banks.

##### Phase 3 - Solidification and Excavation of Pond Sediments

Contaminated sediments from Ponds 2 and 5 were mixed with kiln dust (990 tons) for solidification. The solidified sediments were excavated from Ponds 2 and 5, and were

transported to Pond 1 for compaction. Pond 1 (containment cell) was enlarged to accommodate additional sediments from Pond 5. The total volume of material (kiln dust and solidified sediment) placed and compacted (90 percent) in the containment cell was estimated to be 9,200 cubic yards.

Sediment samples from Ponds 2 and 5 were periodically collected and analyzed during this phase to ensure that the cleanup goals stated in the ROD were achieved.

#### Phase 4 - Construction of RCRA Cap

The Agency constructed a RCRA approved cap over the containment cell as per Remedial Design specifications. The cap consists of a 10-inch gas extraction layer followed by a 24-inch compacted clay layer covered with Flexible Membrane Liner (FML), a 12-inch drainage layer and a 24-inch thick vegetated top cover (seeded with Bermuda grass). The side slopes and drainage ditch were covered with 1 to 3 inch riprap.

#### Phase 5 - Site Closure

Under the Emergency Response Control Section's (ERCS) Technical Assistant Team (TAT) supervision, a six-foot chainlink fence was installed with a locking gate. The fence completely encompasses the RCRA cap and three monitoring wells.

#### Phase 6 - Monitoring Well Installation

Two additional groundwater monitoring wells were installed on the site. The wells (9A-52 feet and 9B-39 feet) were drilled above the Jackson Clay Formation.

#### h. Community Relations Activities

Residents near the Site are aware of activities that have taken place at Gallaway Pits. A public meeting was held on July 21, 1986, to present a summary of the RI/FS process and to explain the proposed remedies for the cleanup of the site. Facts sheets were prepared and distributed to the mailing list. Comments received during the public comment period were addressed in the responsiveness summary of the ROD. Since Gallaway Pits is a satellite of the Arlington Blending Site, the residents of the community are kept informed through community relations efforts held at Arlington Blending.

### III. DEMONSTRATION OF QA/QC FROM CLEANUP ACTIVITIES

The EPA On-Scene Coordinator (OSC) was responsible for ensuring that QA procedures were adhered to during construction activities. Daily logs were recorded and photos of construction activities were taken by TAT. The REM III Design Team provided an on-site field engineer to observe the following construction activities:

- Sediment solidification in Pond 5
- Gas recovery layer and piping system installation, and clay ditch bottom construction
- Impermeable layer construction
- Flexible membrane liner (FML) and drainage layer installation
- Topsoil and perimeter drainage ditch berm construction

During construction oversight, responsibilities of the REM III Team included:

- observing and documenting locations, depths, extent, and other pertinent data describing removal activities and cap construction occurring during the remedial action;
- Being a technical liaison to EPA and the ERCS contractor regarding any field changes with the design engineer and EPA project officer;
- Advising the RPM or OSC of observed discrepancies in construction methods, procedures, or material applications, which could adversely affect the design; and
- Working with ERCS during construction to correct observed discrepancies.

#### QA/QC Followed During Surface Water/Sediment/Waste Sampling

Prior to and during construction activities at the Gallaway Pits site, all closure samples were collected in accordance with the Engineering Support Branch Operations Procedures and Quality Assurance Manual, April, 1986 developed by the Region IV Environmental Services Division.

#### QA/QC Followed During Construction of Cap

The Remedial Design provided recommended material testing and observation services to assure that the landfill met the design specifications. The testing included laboratory permeability

tests, thickness measurements, in situ density, standard Proctor tests, sieve analysis and Atterberg limits. See Remedial Design Report for sampling frequency. The laboratory testing procedures were performed in accordance with the American Society of Testing Materials (ASTM), as specified in the contract.

#### IV. MONITORING RESULTS

After the solidification/removal of material from Ponds 2 and 5, samples were collected from the pond bottom and shipped via overnight delivery to Wadsworth/Alert Laboratory in Ohio for quick turnaround analyses. The samples were analyzed for chlordane, toxaphene, cadmium and arsenic. This procedure was followed to ensure that a "clean level" had been reached prior to collecting the US-EPA closure samples and executing pond closure procedures.

Following a "clean level" report for the screening samples discussed above, closure samples were collected by the TAT personnel from Pond 2 (GP-2) and Pond 5 (GP-5A, western end GP-SB, eastern end). These samples were packaged and shipped to the US-EPA Laboratory, Athens, Georgia for analyses. The result provided verification of the cleanup action levels.

A representative sample of the solidified material was placed in the waste containment cell each work day for 27 consecutive days to document concentrations of metals and pesticides present in the solidified material. This procedure was followed from the initial start day until the cell was completed and Ponds 2 and 5 were declared "clean" by the OSC, and closed out. The samples were then composited into a single sample and shipped to the US-EPA Laboratory, Athens, Georgia for chemical analyses. The soil closure samples did not exceed the maximum contamination level for the EP Toxicity test.

Remedial Design specifications for placement of material in the containment cell required at least 90 percent compaction of the waste. Professional Services Industries Incorporated (PSI) performed nuclear density method testing, and compaction results verified the 90 percent compaction specification was fully met.

The gas recovery layer and collection system were constructed over the solidified waste in accordance with the Remedial Design. Density tests were performed on the material and again 90 percent compaction was achieved.

The impermeable (clay) layer was compacted to exceed the 95 percent compaction requirement. All clay lifts were compacted and graded to a 3 to 5 percent slope from the center of the pond to the perimeter drainage ditch. The impermeable layer was constructed per the intent of the Record of Decision and Remedial

## Design.

The Gundle high density polyethylene 30 MIL liner (black) sheets were welded by the manufacturer's technicians. The anchor trench was excavated; the liner was then field cut and placed into the trench. The field welds were sent to the manufacturer's testing lab for analysis. The material underwent the ASTM D638 Type IV test. According to the Gundle Lining Company Report #2755 dated 8/2/87, all weld samples passed.

The sand lifts were then compacted and graded to a 3 to 5 percent slope to construct the drainage layer. The sand was graded from the center of the pond to the perimeter drainage ditch as per the intent of the design. Over the drainage layer, a geotextile fabric (Mirafi 700X) was placed. After the drainage layer was constructed, two feet of on-site topsoil was installed. The final top slope was graded between a 3 and 5 percent slope. The surface area was disked and fertilized and Bermuda grass seed was planted.

## V. ADDITIONAL REMEDIAL CONSTRUCTION ACTIVITIES

Additional remedial activities were conducted at the site (Fall 1994) to correct deficiencies that had gradually developed from lack of Operation and Maintenance (O&M) activities. Corrective actions needed were as follows:

- Excavate soil from around base of protective covers for Monitoring wells (MW) 3,4 & 7. Correct any deficiencies that exist.
- Repair or replace concrete pads on MW's 1 & 2.
- Assess integrity/usefulness of MW 1 by sounding, sampling or other technique.
- Depending on results from assessment of MW 1, repair cover and lock or install new up gradient MW.
- Re-sampling monitoring wells for site contaminants and include metals, field pH and field conductivity.
- Mow and remove trees/saplings from exclusion zone.
- Sample pond water to determine if leaching is occurring.
- Fill adjacent pond(s) and grade exclusion zone.
- Regrade cap.

To satisfy the above list, the EPA and State of Tennessee entered

into a cooperative agreement in the Fall of 1994.

OHM Corporation conducted remedial construction activities at the site from September through November 1994. Actual field sampling of monitoring wells commenced on October 3, 1994. All of the corrective actions described above were completed during this period. All significant corrective activity was completed by November 14, 1994. OHM Corporation sampled ground water from monitoring wells 1-4, 6, 7 and 9B at the site. Analysis was conducted for pesticides, metals and organics. Temperature, pH and conductivity were also measured. For the contaminants of concern (i.e. pesticides), only two wells showed detectable levels, neither of which is above MCLS. MW-7 had 0.002 mg/L of chlordane and MW-6 had 0.003 mg/L of dieldrin. Slight exceedances above MCLS or action levels of metals (including barium, chromium, copper, lead, manganese, nickel and zinc) were reported from most of the wells sampled.

The State conducted sampling of water from a pond adjacent to the cap area that was to be drained and filled. The water in this pond was transferred to another on-site pond. The purpose of this sampling was to define if leaching from the waste under the cap appeared to be occurring. No contaminants of concern were detected in the pond water samples, verifying that no leaching from the capped area was occurring. However, various levels of several metals were detected in the pond water sample.

#### VI. PROTECTIVENESS

All the completion requirements for this site have been met as specified in OSWER Directive 9320.2-3C. Confirmatory ground water sampling at the site provides further assurance that the site continues to pose no threat to human health or the environment. The only remaining activity to be performed at the site is minor O&M that is guaranteed by the State of Tennessee.

#### VII. SUMMARY OF OPERATION AND MAINTENANCE

The State of Tennessee will implement the O&M plan that will ensure the cap remains protective of public health, welfare and the environment. The additional corrective actions taken (Fall 1994) were intended to significantly reduce previous O&M projections for the site. The State of Tennessee will assume 100% of all O&M costs upon close-out of the cooperative agreement. These costs are expected to be comprised of scheduled inspections and periodic maintenance of the exclusion zone and periodic sampling of monitoring wells.

These corrective activities did not necessitate an amended ROD for the site or an Explanation of Significant Differences.

**VIII. FIVE-YEAR REVIEW**

Since hazardous substances remain on-site above health based levels, the State of Tennessee and EPA will conduct five-year reviews as a matter of policy. The first review was conducted in April 1992 and found the cap protective. The next review is schedule for April 1997.

Approved By:

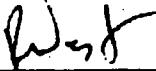


Richard D. Green  
Office of Superfund &  
Emergency Response  
Waste Management Division

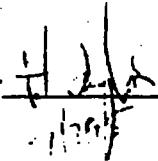
Disapproved By:

Richard D. Green  
Office of Superfund &  
Emergency Response  
Waste Management Division

West



Taylor



Jourdan





STATE OF TENNESSEE  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Division of Superfund  
4<sup>th</sup> Floor, L&C Annex  
101 Church Street  
Nashville, TN 37243-1538

13 March, 2000

Mr. Robert West  
U.S. Environmental Protection Agency  
Waste Management Division  
Atlanta Federal Center  
61 Forsyth Street, SW  
Atlanta, GA 30303

RE: Gallaway Pits, Gallaway, Fayette County, Tennessee  
EPA Site #TND080728992 TDSF Site # 24-503

Subject: Recommendation for Archival

Dear Mr. West:

The Tennessee Division of Superfund (TDSF) hereby transmits a copy of the Remedial Action Report for the Gallaway Pits site. TDSF recommends that this site be considered for archival from the CERCLIS listing, since no contamination remains on site.

If you have any questions, call me at (615) 532-0984 or e-mail me at [tstewart2@mail.state.tn.us](mailto:tstewart2@mail.state.tn.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Stewart", written over a horizontal line.

Tim Stewart  
Voluntary Cleanup, Oversight, and Assistance Program  
Division of Superfund

XC: TDSF Central Office and EAC - Memphis File

DIVISION OF  
SUPERFUND

1997 OCT -8 PM 2:05

TENNESSEE DEPARTMENT  
OF ENVIRONMENTAL  
CONSERVATION

**REMEDIAL ACTION REPORT**  
**FOR**  
**GALLAWAY PITS**  
**GALLAWAY, FAYETTE COUNTY**  
**TDSF SITE NUMBER 24-503**

**AUGUST 22, 1997**

Prepared by

**TENNESSEE DIVISION OF SUPERFUND**  
**Nashville Environmental Field Office**  
**537 Brick Church Park Drive**  
**Nashville, Tennessee 37207**

SPECIALIZED ASSAYS ENVIRONMENTAL  
40 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART BLAND  
504 INTERDUE BLVD SOUTH  
NASHVILLE, TN 37203

Lab Number: 97-AD63060

Sample ID: #6

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:30

Project Name: GULLAWAY PITS

Date Received: 7/21/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

-- SURROGATE RECOVERIES --

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 9 / 2 / 97

Theodore J. Duello Ph.D., Q.A. Officer  
Michael H. Durn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 160 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A063061

Sample ID: #7

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:15

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

RIP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Spig Level	Recovery %		
Arsenic	<0.10	ng/l	5.0	102	8/1/97	6010A
Barium	<1.00	ng/l	100	93	8/1/97	6010A
Cadmium	<0.10	ng/l	1.0	102	8/1/97	6010A
Chromium	<0.50	ng/l	5.0	95	8/1/97	6010A
Lead	<0.50	ng/l	5.0	98	8/1/97	6010A
Mercury	<0.010	ng/l	0.20	92	8/1/97	7471
Selenium	<0.10	ng/l	1.0	114	8/1/97	6010A
Silver	<0.10	ng/l	5.0	90	8/1/97	6010A
Chlordane	<0.015	ng/l	0.030	87	8/2/97	8080
2,4-D	<5.0	ng/l	10.0	135	8/2/97	8150
Endrin	<0.0100	ng/l	0.02	124	8/2/97	8080
Heptachlor	<0.0090	ng/l	0.008	78	8/2/97	8080
Lindane	<0.200	ng/l	0.4	82	8/2/97	8080
Methoxychlor	<1.0	ng/l	10.0	94	8/2/97	8080
Toxaphene	<0.250	ng/l	0.50	71	8/2/97	8080
Silver	<0.50	ng/l	1.0	144	8/2/97	8150
Heptachlor epoxide	<0.0050	ng/l	0.005	92	8/2/97	8080
TCP Extraction	COMPLETED				9/1/97	1311

ND = Not detected at the report limit.

Surrogate Recoveries

Surrogate	% Recovery	Target Range
Post PCB Surrogate, TOM	57.0	22. - 118.
Post PCB Surrogate, JEC	78.0	22. - 115.
Heptachlor Sur., JOM	46.	15. - 135.

AUG-02-1997 17:32

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
360 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART ELLIARD  
904 INTERSTATE BLVD SOUTH  
NASHVILLE, TN 37210

Lot Number: 97-2063061

Sample ID: 87

Date Collected: 7/30/97

Project: 97-15327

Time Collected: 6:15

Project Name: GILLAWAY PTIS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 /97

Theodore J. Duella, Ph.D., C.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Janny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 60 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A061062

Sample ID: #3

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:30

Project Name: CALLAWAY PITS

Date Received: 7/31/97

Sampler J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

ICLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	<0.10	ng/l	5.0	102		8/1/97	6010A
Barium	<1.00	ng/l	100	93		8/1/97	6010A
Cadmium	<0.10	ng/l	1.0	102		8/1/97	6010A
Chromium	<0.50	ng/l	5.0	95		8/1/97	6010A
Lead	<0.50	ng/l	5.0	98		8/1/97	6010A
Mercury	<0.010	ng/l	0.20	23		8/1/97	7471
Selenium	<0.10	ng/l	1.0	114		8/1/97	6010A
Silver	<0.10	ng/l	5.0	92		8/1/97	6010A
Chlordane	<0.015	ng/l	0.030	87		8/2/97	8080
2,4-D	<5.0	ng/l	10.0	120		8/2/97	8150
Endrin	<0.0100	ng/l	0.02	115		8/2/97	8080
Heptachlor	<0.0050	ng/l	0.008	82		8/2/97	8080
Lindane	<0.200	ng/l	0.4	85		8/2/97	8080
Methoxychlor	<1.0	ng/l	10.0	64		8/2/97	8080
Toxaphene	<0.250	ng/l	0.50	56		8/2/97	8080
Silver	<0.50	ng/l	1.0	137		8/2/97	8150
Heptachlor epoxide	<0.0050	ng/l	0.008	30		8/2/97	8080
ICLP Extraction	COMPLETED					8/1/97	1311

ND = Not detected at the report limit.

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
Rest PCB Surrogate, TOX	40.0	21 - 135
Rest PCB Surrogate, DDC	23.0	21 - 135
Herbicide Surrogate, DDA	39	15 - 135
AUG-22-1997 17:32	Specialized Assays	

Theodore J. D'Alto, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

Report Approved By: \_\_\_\_\_ Report Date: 8/2/97

Antigen Recovery Target Range

-- SURVEIL MONITORS --

Scale Certification: 02008  
Sample ID: 008  
Project Name: ORLSBY PITS  
Time Collected: 6:30  
Date Collected: 7/20/97  
Time Received: 9:00  
Date Received: 7/21/97  
Sample Type: Solid waste

FOUR SEVEN 45Z  
ACTN SURVEIL BLAND  
504 EMERSON BLVD. SOUTH  
NASHVILLE, TN 37204  
Lab Number: 97-AD0305

\* Original report and a copy of the chain of custody will follow by mail.

RECEIVED NUCLEAR ENVIRONMENTAL  
IN FORUM CENTER DRIVE  
NASHVILLE, TENNESSEE 37204

SPECIALIZED ASSAYS ENVIRONMENTAL  
 60 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A061063

Sample ID: #9

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:45

Project Name: CALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 62000

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Arsenic	< 0.10	mg/l	5.0	122	8/1/97	6010A
Barium	< 1.00	mg/l	100	93	8/1/97	6010A
Cadmium	< 0.10	mg/l	1.0	122	8/1/97	6010A
Chromium	< 0.50	mg/l	5.0	95	8/1/97	6010A
Cu	< 0.50	mg/l	5.0	99	8/1/97	6010A
Mercury	< 0.010	mg/l	0.20	99	8/1/97	747
Selenium	< 0.10	mg/l	1.0	114	8/1/97	6010A
Silver	< 0.10	mg/l	5.0	92	8/1/97	6010A
Chloride	< 0.015	mg/l	0.100	70	8/2/97	8080
2,4-D	< 5.0	mg/l	10.0	120	8/2/97	6150
Bran	< 0.0100	mg/l	0.02	146	8/2/97	8080
Heptachlor	< 0.0050	mg/l	0.008	107	8/2/97	8080
Lindane	< 0.200	mg/l	0.4	113	8/2/97	8080
Methoxychlor	< 1.0	mg/l	10.0	95	8/2/97	8080
Toxaphene	< 0.250	mg/l	0.50	61	8/2/97	8080
Silver	< 0.50	mg/l	1.0	140	8/2/97	6150
Heptachlor epoxide	< 0.0050	mg/l	0.008	120	8/2/97	8080
TCLP Extraction:	COMPLETED				8/1/97	1311

ND = Not detected at the report limit.

Surrogate Recoveries

Surrogate	% Recovery	Target Range
Fast PCB Surrogate, TOM	83.0	22 - 135
Fast PCB Surrogate, DEC	99.0	22 - 135
Herbicide Surv., DCA	38	15 - 135

AUG-02-1997 17:33

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
70 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATIN. SILVER ISLAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37203

Lab Number: 97-2063063

Sample ID: #9

Date Collected: 7/20/97

Project: 97-15027

Time Collected: 6:45

Project Name: GULLAWAY PETS

Date Received: 7/21/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: J2008

Sample Type: Solid waste

-- SURFACE RECOVERIES --

Substrate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 / 97

Theodore J. Dusilo, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-AC62138

Sample ID: #1

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:00

Project Name: GALLAWAY FITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	< 0.10	mg/l	5.0	132		7/31/97	6010A
Barium	< 1.00	mg/l	100	89		7/31/97	6010A
Cadmium	< 0.10	mg/l	1.0	97		7/31/97	6010A
Chromium	< 0.50	mg/l	5.0	91		7/31/97	6010A
Lead	< 0.50	mg/l	5.0	94		7/31/97	6010A
Mercury	< 0.010	mg/l	0.20	91		7/30/97	747
Selenium	< 0.10	mg/l	1.0	111		7/31/97	6010A
Silver	< 0.10	mg/l	5.0	90		7/31/97	6010A
Chlordane	< 0.015	mg/l	0.100	130		8/1/97	8080
2,4-D	< 5.0	mg/l	10.0	106		8/1/97	8150
Endrin	< 0.0100	mg/l	0.02	130		8/1/97	8080
Heptachlor	< 0.0050	mg/l	0.008	123		8/1/97	8080
Lindane	< 0.200	mg/l	0.4	125		8/1/97	8080
Methoxychlor	< 1.0	mg/l	10.0	154		8/1/97	8080
Toxaphene	< 0.250	mg/l	0.50	135		8/1/97	8080
Silvex	< 0.50	mg/l	1.0	91		8/1/97	8150
Heptachlor epoxide	< 0.0050	mg/l	0.008	136		8/1/97	8080
TCLP Extraction:	COMPLETED					7/30/97	1311

ND = Not detected at the report limit.

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
Post/FOB Surrogate, TCM	67.0	22 - 135
Post/FOB Surrogate, DEK	15.0	22 - 135
Herbicide Sur., DCPA	56	15 - 135

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
50 Robert Crayton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
RTM. STUMP ISLAND  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-206238

Sample ID: M1

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:00

Project Name: GULLSON/ FTIS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02005

Sample Type: Solid waste

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
-----	-----	-----

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Diello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Canny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062179

Sample ID: #0

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:10

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. COBE

Time Received: 0:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	ng/L	5.0	102		7/31/97	6013A
Barium	<1.00	ng/L	100	89		7/31/97	6013A
Cadmium	<0.10	ng/L	1.0	97		7/31/97	6013A
Chromium	<0.50	ng/L	5.0	91		7/31/97	6013A
Lead	<0.50	ng/L	5.0	94		7/31/97	6013A
Manganese	<0.010	ng/L	0.20	91		7/30/97	7471
Selenium	<0.10	ng/L	1.0	111		7/31/97	6016A
Silver	<0.10	ng/L	5.0	90		7/31/97	6016A
Chlordane	<0.015	ng/L	0.030	80		8/1/97	8080
2,4-D	<5.0	ng/L	10.0	84		8/1/97	8150
Endrin	<0.0100	ng/L	0.02	89		8/1/97	8080
Heptachlor	<0.0050	ng/L	0.008	97		8/1/97	8080
Lindane	<0.200	ng/L	0.4	100		8/1/97	8080
Methoxychlor	<1.0	ng/L	10.0	126		8/1/97	8080
Toxaphene	<0.250	ng/L	0.50	137		8/1/97	8080
Silvex	<0.50	ng/L	1.0	74		8/1/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	126		8/1/97	8080
TCLP Extraction:	COMPLETED					7/29/97	1311

ND = Not detected at the report limit.

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
Rest / PCB Surrogate, TOX	75.0	22. - 135.
Rest / PCB Surrogate, CEC	9.0	22. - 135.
Herbicide Sur., DONA	50.	15. - 135.
ALG-21-1997 17:51	Specialized Assays	

SPECIALIZED ASSAYS ENVIRONMENTAL  
400 Foster-Craigmont Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
RTN. STUNT BLVD  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE TN 37210

Lab Number: 97-1062133

Sample ID: #2

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GULFWAY PTIS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

== SURROGATE RECOVERIES ==

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duellio, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 660 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062140

Sample ID: #3

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:20

Project Name: GALLANAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	<0.10	mg/L	5.0	102		7/31/97	6012A
Barium	<1.00	mg/L	100	89		7/31/97	6012A
Cadmium	<0.10	mg/L	1.0	97		7/31/97	6012A
Chromium	<0.50	mg/L	5.0	92		7/31/97	6012A
Lead	<0.50	mg/L	5.0	94		7/31/97	6012A
Mercury	<0.010	mg/L	0.20	92		7/30/97	7472
Selenium	<0.10	mg/L	1.0	111		7/31/97	6012A
Silver	<0.10	mg/L	5.0	90		7/31/97	6012A
Chlordane	<0.015	mg/L	0.030	81		8/1/97	8090
1,4-D	<5.0	mg/L	10.0	87		8/1/97	8150
Dieldrin	<0.0100	mg/L	0.02	92		8/1/97	8080
Heptachlor	<0.0050	mg/L	0.008	130		9/1/97	8080
Lindane	<0.200	mg/L	0.4	130		8/1/97	8080
Methoxychlor	<1.0	mg/L	10.0	130		8/1/97	8080
Toxaphene	<0.250	mg/L	0.50	109		8/1/97	8080
Silver	<0.50	mg/L	1.0	75		9/1/97	8150
Heptachlor epoxide	<0.0050	mg/L	0.008	99		9/1/97	8080
TCLP Extraction	COMPLETED					7/30/97	1311

ND = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Perf / CS Surrogate, TOX	91.0	22. - 135.
Perf / PCB Surrogate, DEC	14.0	22. - 135.
Herbicide Sur., DCA	60.	15. - 135.

AUG-01-1997 17:53

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
400 Foster Overington Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
MITH. STUNT BLVD  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 77-2062140

Sample ID: #3

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GILMANY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: C2008

Sample Type: Solid waste

-- SURROGATE RECOVERIES --

Surrogate	% Recovery	Target Range
-----	-----	-----

Report Approved By: \_\_\_\_\_

Report Date: 9/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 750 Foster Craighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART ISLAND  
 504 INTERSTATE BLVD. SCUTE  
 NASHVILLE, TN 37210

Lab Number: 97-A062241

Sample ID: #4

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	MATRIX Spike		Date	Method
			Req Limit	Recovery (%)		
Arsenic	<0.10	mg/L	5.0	102	7/31/97	6010A
Barium	<1.00	mg/L	100	89	7/31/97	6010A
Cadmium	<0.10	mg/L	1.0	97	7/31/97	6010A
Chromium	<0.50	mg/L	5.0	91	7/31/97	6010A
Lead	<0.50	mg/L	5.0	94	7/31/97	6010A
Mercury	<0.020	mg/L	0.20	91	7/30/97	7471
Selenium	<0.10	mg/L	1.0	111	7/31/97	6010A
Silver	<0.10	mg/L	5.0	90	7/31/97	6010A
Chloride	<0.015	mg/L	0.030	66	8/1/97	9080
2,4-D	<5.0	mg/L	10.0	70	8/1/97	9150
Endrin	<0.0100	mg/L	0.02	86	8/1/97	9080
Heptachlor	<0.0050	mg/L	0.008	91	8/1/97	9080
Lindane	<0.200	mg/L	0.4	94	8/1/97	9080
Methoxychlor	<1.0	mg/L	10.0	124	8/1/97	9080
Toxaphene	<0.250	mg/L	0.50	103	8/1/97	9080
Silver	<0.50	mg/L	1.0	78	8/1/97	9130
Heptachlor epoxide	<0.0050	mg/L	0.008	99	8/1/97	9080
TCLP Extraction	COMPLETE				7/30/97	1111

ND = Not detected at the report limit.

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
Part PCB Surrogate, TOX	71.0	22 - 136
Part PCB Surrogate, OEC	7.0	22 - 136
Methoxide Sur., DDA	112	15 - 136

AUG-21-1997 17:55

Specialized Assays

P. 08

SPECIALIZED ASSAYS ENVIRONMENTAL  
60 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4822  
ATIN, STUNTS ISLAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37216

Lab Number: 77-4662-01

Sample ID: M4

Date Collected: 7/28/97

Project: 37-15027

Time Collected: 15:30

Project Name: GILMORY FITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

→ SURROGATE RECOVERIES →

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duellio, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART ISLAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062142

Sample ID: #5

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:40

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery %		
Arsenic	<0.10	mg/L	5.0	102	7/31/97	601CA
Barium	<1.00	mg/L	100	99	7/31/97	601CA
Cadmium	<0.10	mg/L	1.0	37	7/31/97	601CA
Chromium	<0.50	mg/L	5.0	21	7/31/97	601CA
Lead	<0.50	mg/L	5.0	34	7/31/97	601CA
Mercury	<0.010	mg/L	0.20	21	7/30/97	747E
Selenium	<0.10	mg/L	1.0	111	7/31/97	601CA
Silver	<0.10	mg/L	5.0	30	7/31/97	601CA
Chlordane	<0.015	mg/L	0.030	64	8/1/97	808C
2,4-D	<5.0	mg/L	10.0	119	8/1/97	815C
Endrin	<0.0103	mg/L	0.02	101	8/1/97	808C
Heptachlor	<0.0050	mg/L	0.008	21	8/1/97	808C
Lindane	<0.200	mg/L	0.4	121	8/1/97	808C
Methoxychlor	<1.0	mg/L	10.0	143	8/1/97	808C
Toxaphene	<0.250	mg/L	0.50	109	8/1/97	808C
Silver	<0.50	mg/L	1.0	70	8/1/97	815C
Heptachlor epoxide	<0.0050	mg/L	0.008	125	8/1/97	808C
TCLP Extraction	COMPLETED				7/30/97	1311

NC = Not detected at the report limit.

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
Post / PCB Surrogate, TOM	91.0	22. - 115.
Post / PCB Surrogate, DBC	8.0	22. - 135.
Metalside Sur, CMA	89	15. - 135.
PLG-21-1997 17:00	Specialized Assays	

SPECIALIZED ASSESS ENVIRONMENTAL  
77 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
AIR STUMP ISLAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-2062142

Sample ID: #5

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:40

Project Name: GULLAWAY FTS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

**APPENDIX D**

**Five Year Review – September 28, 2000**

**GALLAWAY PITS  
SUPERFUND SITE**

**FIVE-YEAR REVIEW  
SEPTEMBER 28, 2000**



**U.S. Environmental Protection Agency  
Region IV**

## EPA Five-Year Review Signature Cover

### Key Review Information

Site Identification			
Site name: <i>Galloway Pits Superfund Site</i>		EPA ID: <i>TND980728992</i>	
Region: <i>4</i>	State: <i>TN</i>	City/County: <i>Fayette County</i>	
Site Status			
NPL status: <i>Deleted</i>			
Remediation status (under construction, operating, complete): <i>complete</i>			
Multiple OU's* (highlight):		<input checked="" type="checkbox"/> <b>Y</b>	<input type="checkbox"/> <b>N</b>
Construction completion date: <i>10/87</i>			
Fund/PRP/Federal facility lead: <i>Fund</i>		Lead agency: <i>State</i>	
Has site been put into reuse? (highlight): <input checked="" type="checkbox"/> <b>Y</b> <input type="checkbox"/> <b>N</b>			
Review Status			
Who conducted the review (EPA Region, State, Federal agency): <i>EPA Region 4</i>			
Author name: <i>Robert West</i>		Author title: <i>RPM</i>	
Author affiliation: <i>Project Manager</i>			
Review period: <i>** September 2000</i>		Date(s) of site inspection: <i>NA</i>	
Highlight:	Statutory*** Policy	Policy Type (name): 1. Pre-SARA 2. Ongoing 3. Removal only 4. Regional Discretion	Review number (1, 2, etc.)  <i>2</i>
Triggering action event: <i>**** Wastelan</i>			
Trigger action date: <i>10/1993</i>			
Due date: <i>10/1997</i>			

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the five-year review in WasteLAN.]

\*\*\* [see page B-8 and Chapter 1 for further explanation.]

\*\*\*\* [see page B-9 and Chapter 1 for further explanation.]

**Deficiencies:**

None

**Recommendations and Required Actions:**

EPA Region 4 has concluded that a second five-year review is not needed at the Gallaway Ponds site in Fayette County, Tennessee. This report will be the last review of any kind needed at the Gallaway Ponds site. Neither Operation and Maintenance (O&M) activities nor Five-year Reviews are applicable at this site because of remedial actions taken by the Tennessee Department of Environment and Conservation (TDEC). TDEC, without notification to EPA, conducted remedial actions in August 1997 that removed all hazardous substances from the site (attachment 1), hence the cease of Federal Superfund involvement at this site.

**Protectiveness Statement(s):**

NA

**Other Comments:**

**Signature of EPA Regional Administrator or Division Director and Date**



Richard D. Green, Director  
Waste Management Division

29 SEP 00  
Date

## I. Introduction

EPA Region 4 has conducted a second five-year review of the remedial actions implemented at the Gallaway Pits Site in Fayette County, Tennessee. This review was conducted in September 2000. This report documents the results of the review. The purpose of the five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by policy. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c), as amended, states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the second five-year review for the Gallaway Pits Site. The trigger for this policy review is the first five-year review date shown in EPA's WasteLAN database: October 4, 1993. However, due to the fact that the Tennessee Department of Environment and Conservation (TDEC) conducted a removal action of all wastes contained onsite. **Region 4 has concluded that a second five-year review is not needed at the Gallaway Ponds site in Fayette County, Tennessee. This report will be the last review of any kind needed at the Gallaway Ponds site. Neither Operation and Maintenance (O&M) activities nor Five-year Reviews are applicable at this site because of remedial actions taken by the Tennessee Department of Environment and Conservation (TDEC). TDEC, without notification to EPA, conducted remedial actions in August 1997 that removed all hazardous substances from the site (attachment 1), hence the cease of Federal Superfund involvement at this site.** The remedial action performed July 1997 consisted of the landfill cap; the excavation, transportation and off-site disposal of the waste material, the re-grading of the pit, and the abandonment of the eight monitoring wells. After the cap was removed, a total of 12,074 tons of waste were removed and sent to the BFI-North Shelby Landfill for disposal. Once all the waste was removed, nine

confirmatory samples were taken and were all below detections levels. Finally, the monitoring wells were filled with grout slurry and the well casing were removed. For more information please refer to attachment 1.

## II. Site Chronology

**Table 1: Chronology of Site Events**

Date	Event
1/80	Initial discovery of the problem
10/81	Removal action
9/83	NPL listing
9/86	RI/FS complete
9/26/86	ROD signature
6/87	Remedial design start
3/88	Remedial design completion
6/87	RA start
6/87	Construction start
10/87	Construction finish
10/87	Construction completion
10/4/93	First five-year review report

## III. Background

The Gallaway Pits Site (five-acres) was extensively mined for sand and gravel, producing a landscape dotted with water-filled pits up to 50 feet deep. Some of the pits have been used for disposal of liquid and solid waste (mainly pesticide or pesticide residues), glass jars and drums. The site was proposed for inclusion on the National Priorities List (NPL) in December 1982 and appeared on the final NPL in September 1983. The primary factor contributing to the site being on the NPL was the potential for groundwater contamination. Preliminary sampling of the pond water and sediments showed elevated levels of pesticides (i.e. Chlordane, Endrin, and Lindane). The groundwater samples did not reveal any contamination; however, potential existed for groundwater contamination because of the types and quantities of waste at the site. Finally, run off from the site threatened off-site biota.

In October 1983, the EPA conducted an emergency cleanup. The cleanup consisting of the excavation and offsite disposal of contaminated sludge and the onsite treatment of the pond water.

The treatment process involved the carbon filtration of the pond water to limits established by the Tennessee Department of Health and Environment (TDHE), Division of Water Quality Control.

In February 1984, EPA obligated funds to conduct a Remedial Investigation/Feasibility Study (RI/FS). NUS Corporation was tasked to perform the RI/FS. Based on extensive discussions with the EPA On-Scene Coordinator for the federal cleanup action and a review of site background data, it was determined that a RI would be appropriate for this site. The Remedial Investigation Report was finalized in April 1986. The draft Focused Feasibility Study was completed in June 1986 and finalized in September 1986. The public comment period ended on August 12, 1986.

### **Community Relations Activities**

The State and EPA agreed that community relations activities at the site would be conducted in accordance with the approved community relations plans. In conducting community relations activities pursuant to this CA, EPA and the State agreed to comply with all relevant EPA policy and guidance on community relations programs and procedures. Additional community efforts were not determined to be necessary owing to the fact that these corrective efforts were directed at previous remedial work that met all guidance for community relations programs and procedures.

### **Remedial Investigation Results**

The Focused Remedial Investigation Report included a sampling program for each of the potentially affected environmental media: surface water, sediment, surface soils, and groundwater. The following sections describe the results of this investigation:

#### **1. Onsite Surface Water/Sediment (Ponds 1-9)**

Contaminants detected in the surface waters of Ponds 1, 2, 5, 8, and 9 exceed the acute Ambient Water Quality Criteria (AWQC) for the following parameters: Pond 1 - Chlordane, Pond 2 - Toxaphene, Pond 5 - Cadmium, Pond 8 - Arsenic, and Pond 9 - Cadmium.

Chronic AWQC limits were exceeded in Ponds 1, 2, 3, 4, 8, and 9 for pesticides and in Ponds 5, 8, and 9 for inorganics. These contaminant levels were high enough to be harmful to aquatic life and probably preclude the presence of many sensitive species in the ponds.

The sediment in Ponds 1, 2, 3, 4, 8, and 9 showed pesticide contamination. Chlordane is the most prevalent contaminant, with a few occurrences of Dieldrin and Toxaphene. The sediment in Pond 7 contained Cadmium above background levels, while Ponds 8 and 9 contained high levels of Arsenic.

#### **2. Onsite Surface Soils**

Chlordane was detected in the surface soils around the northern half of Pond 1 and between Ponds

1 and 9. Arsenic and Cadmium were also detected in the surface soils. Similar levels of Arsenic were detected over much of the site; however, arsenic was detected in two background locations and therefore may not be site-related. Cadmium was detected in a sample located west of Pond 1, which was the same sample that contained the highest Chlordane value. Cadmium was also detected in a sample that was located between Ponds 1 and 3.

### 3. Onsite Subsurface Soil/Groundwater

No pesticides were detected in the subsurface soil sample located west of Pond 1. Samples were collected at 5-foot intervals from a depth of 5 feet to a depth of 52 feet. As a class, pesticides have low mobility and, therefore, are unlikely to migrate to any great depth. Chloroform, a common laboratory solvent, was estimated to be present at very low levels (less than the contract-required detection limit) in the upper 10 feet of the boring. Other volatiles, which were not found elsewhere on site, were found in the deepest subsurface sample at a depth of 51 feet. This sample was collected from within the top of the Jackson Clay Formation. Cadmium was also present in this sample.

### Risk Assessment

A quantitative risk assessment was performed for various contaminant exposure pathways. Risks for the exposure pathways were calculated for the site for the conditions of both mining and no mining. Based on the available data and risk assessment assumptions, the exposure pathways presented no unacceptable risks to human receptors. The only unacceptable risk presented by the Site was the potential risk to off site biota that could occur if Ponds 1, 2, or 5 would overflow to off site tributaries.

## IV Remedial Actions

### A. Record of Decision Finding

The Record of Decision (ROD) outlined the following selected remedial actions:

Dilution of water in Ponds 1, 2, and 5 with city water to meet Ambient Water Quality Criteria and subsequent discharge to an unnamed tributary of Cane Creek;

Excavation of contaminated sediments from Ponds 2 and 5, and consolidation of these sediments in Pond 1;

Institutional controls, such as fencing around Pond 1, restriction on mining, and methods to ensure that future land uses are compatible with the selected remedy;

Proper site closure under Subtitle C of RCRA, including capping of Pond 1;

Operation and Maintenance (O&M) activities that include groundwater monitoring inspection and maintenance of cap.

## **B. Remedy Implementation**

The EBASCO Services, Inc. was tasked to perform a Remedial Design for the selected actions recommended by the ROD at the Site. Listed below are the design criteria:

- Determine a kiln dust/sediment ratio for the solidification process;
- Determine the below grade excavation configuration of Pond 1 to store the solidified waste;
- Design a RCRA cap over the below grade configuration;
- Determine the safety factor against bearing capacity failure of foundation soils underlying the solidified waste and RCRA cap;  
Perform an effective analysis of foundation soils to check for possible detrimental settlement of RCRA cap;
- Design a gas recovery system based on the characteristics of the known contaminants and the solidification process;
- Design a drainage ditch system to collect and route runoff away from the RCRA cap;
- Provide performance specifications for construction of the cap and guidelines for testing and observations;
- Determine a revised above grade configuration based on the actual volume of solidified waste placed in Pond 1.

## **C. Construction Activities Performed**

Construction activities were initiated in June 1987 at the site. These activities are described below:

### **Phase 1 - Pond Water Sampling**

Prior to beginning the Removal Action, surface water and sediment samples were collected for chemical analysis and bioassay tests to determine the current-level of contamination in Ponds 1, 2, and 5. Based on the analytical results, EPA concluded that onsite treatment was not required prior to discharge and that the water could be released directly to an unnamed tributary of Cane Creek without stressing natural biota.

### **Phase 2 - Water Evacuation of Ponds 1, 2, and 5**

Water was evacuated from Ponds 1, 2, and 5 using high velocity pumps to a nearby tributary. In addition, trees and brush were cleared from the pond banks.

#### **Phase 3 - Solidification and Excavation of Pond Sediments**

Contaminated sediments from Ponds 2 and 5 were mixed with kiln dust (990 tons) for solidification. The solidified sediments were excavated from Ponds 2 and 5, and were transported to Pond 1 for compaction. Pond 1 (containment cell) was enlarged to accommodate additional sediments from Pond 5. The total volume of material (kiln dust and solidified sediment) placed and compacted (99 percent) in the containment cell was estimated to be 9,200 cubic yards.

Sediment samples from Ponds 2 and 5 were periodically collected and analyzed during this phase to ensure that the clean-up goals stated in the ROD were achieved.

#### **Phase 4 - Construction of RCRA Cap**

The Agency constructed a RCRA approved cap over the containment cell as per Remedial Design specifications. The cap consists of a 10-inch gas extraction layer followed by a 24-inch compacted clay layer covered with flexible membrane liner (FML), a 12-inch drainage layer and a 24-inch thick vegetated top cover (seeded with Bermuda grass). The side slopes and drainage ditch were covered with 1 to 3 inch riprap.

#### **Phase 5 - Site Closure**

Under the Emergency Response Control Section's (ERCS) Technical Assistant Team (TAT) supervision, a six-foot chainlink fence was installed with a locking gate. The fence completely encompasses the RCRA cap and three monitoring wells.

#### **Phase 6 - Monitoring Well Installation**

Two additional groundwater monitoring wells were installed on the site. The wells (9A-52 feet and 9B-39 feet) were drilled above the Jackson Clay Formation.

### **D. Progress Since the Last Five-Year Review**

During the first five-year review, the remedy was found to be protective of human health and the environment, however some deficiencies were noted. Additional remedial activities were conducted at the site (Fall 1994) to correct deficiencies that had gradually developed from lack of Operation and Maintenance (O&M) activities. Corrective actions needed were as follows:

- Excavate soil from around base of protective covers for Monitoring wells (MW) 3,4 & 7. Correct any deficiencies that exist.

- Repair or replace concrete pads on MW's 1 & 2.
- Assess integrity/usefulness of MW 1 by sounding, sampling or other technique.
- Consistence with results from 3, repair cover and lock or install new up gradient MW.
- Re-sampling monitoring for site contaminants and include metals, field pH and field conductivity.
- Mow and remove trees/saplings from exclusion zone.
- Sample pond water to determine if leaching is occurring.
- Fill ponds and grade exclusion zone.
- Regrade cap.

To satisfy the above list, the EPA and state of Tennessee entered into a cooperative agreement Fall 1994.

OHM Corporation conducted remedial construction activities at the site from September through November 1994. Actual field sampling of monitoring well commenced on October 3, 1994. All of the corrective actions described above were completed during this period. All significant corrective activity was completed by November 14, 1994. OHM Corporation sampled ground water from monitoring wells 1-4, 6, 7 and 9B at the site. Analysis was conducted for pesticides, metals and organics. Temperature, pH and conductivity were also measured. The contaminants of concern (i.e. pesticides) only two wells showed detectable levels, neither of which is above MCLS. MW-7 had 0.002 mg/L of chlordane and MW-6 had 0.003 mg/L of dieldrin. Slight exceedances above MCLs or action levels of metals including barium, chromium, copper, lead, manganese, nickel and zinc were reported from most of the wells sampled. The confidence level is very high that the source of the metals are a result of leaching from monitoring well casing, especially considering that relatively low pH were measured at the time of the sampling event.

The State conducted sampling of water from a pond adjacent to the cap area that was to be drained and filled. The water in this pond was transferred to another on-site pond. The purpose of this sampling was to define if leaching from the waste under the cap appeared to be occurring. No contaminants of concern were detected in the pond water samples, so no evidence of leaching from the capped area was interpreted. However, various levels of several metals were detected in the pond water sample. No impact to previous remedial action at the site is judged to have resulted from these corrective activities.

## **V Recommendation and Required Action**

EPA Region 4 has concluded that a second five-year review is not needed at the Gallaway Ponds site in Fayette County, Tennessee. This report will be the last review of any kind needed at the Gallaway Ponds site. Neither Operation and Maintenance (O&M) activities nor Five-year Reviews are applicable at this site because of remedial actions taken by the Tennessee Department of Environment and Conservation (TDEC). TDEC, without notification to EPA, conducted remedial actions in August 1997 that removed all hazardous substances from the site (attachment 1), hence the cease of Federal Superfund involvement at this site.

### **Attachment(s):**

Attachment A: TDEC Remedial Action Report

---

# Attachment 1



STATE OF TENNESSEE  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Division of Superfund  
4<sup>th</sup> Floor, L&C Annex  
401 Church Street  
Nashville, TN 37243-1538

13 March, 2000

Mr. Robert West  
U.S. Environmental Protection Agency  
Waste Management Division  
Atlanta Federal Center  
61 Forsyth Street, SW  
Atlanta, GA 30303

RE: Gallaway Pits, Gallaway, Fayette County, Tennessee  
EPA Site #TND980728902 TDSF Site # 24-503

Subject: Recommendation for Archival

Dear Mr. West:

The Tennessee Division of Superfund (TDSF) hereby transmits a copy of the Remedial Action Report for the Gallaway Pits site. TDSF recommends that this site be considered for archival from the CERCLIS listing, since no contamination remains on site.

If you have any questions, call me at (615) 532-0984 or e-mail me at [tstewart2@mail.state.tn.us](mailto:tstewart2@mail.state.tn.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Stewart", written over a horizontal line.

Tim Stewart  
Voluntary Cleanup, Oversight, and Assistance Program  
Division of Superfund

XC: TDSF Central Office and EAC - Memphis File

DIVISION OF  
SUPERFUND

1997 OCT -8 PM 2:05

TENNESSEE DEPARTMENT  
OF ENVIRONMENTAL  
CONSERVATION

**REMEDIAL ACTION REPORT**  
**FOR**  
**GALLAWAY PITS**  
**GALLAWAY, FAYETTE COUNTY**  
**TDSF SITE NUMBER 24-503**

**AUGUST 22, 1997**

Prepared by

**TENNESSEE DIVISION OF SUPERFUND**  
**Nashville Environmental Field Office**  
**537 Brick Church Park Drive**  
**Nashville, Tennessee 37207**

## **DESCRIPTION OF WORK PERFORMED**

The remedial action performed in July, 1997 consisted of the removal of the landfill cap; the excavation, transportation and off-site disposal of the waste material, the re-grading of the pit, and the abandonment of the eight monitoring wells.

The cap consisted of four (4) inches of river gravel, a geotextile fabric, two (2) feet of soil, a geotextile fabric, three (3) feet of soil, one (1) foot of sand, a geomembrane, three (3) feet of clay, and six (6) inches of sand. The gas vent outlet pipes on top of the cap extended only through the first geotextile layer and was not connected to any additional piping. The gas collection piping in the top layer of sand was left over well screen and was not connected together in any fashion. One sample was taken at the request of the Tennessee Division of Solid Waste Management prior to the issuance of the Special Waste permit.

After removal of the cap, 12,074 tons of waste were removed and sent to the BFI - North Shelby Landfill for disposal. Once all waste was removed, nine confirmatory samples were taken from the pit bottom and were below detection levels. Once the sample results were received, the north and south sides of the pit were sloped and the bottom was leveled off. A trench was cut in the southeastern corner of the pit to aid in stormwater removal. All re-grading work was performed as per the wishes of the property owner who expects to mine gravel and sand from the pit and pit area.

The monitoring wells were filled with a bentonite - cement grout slurry utilizing a grout plant and tremie pipe. Once the slurry set-up, the well casings were removed to at least thirty (30) inches below ground surface. The disturbed area around the church well was seeded with fescue.

Nine confirmatory samples were taken from the pit bottom and run for TCLP pesticides/herbicides. The samples were taken on a grid system and showed concentrations below the detectable limits.

No variations from the Request for Bids information was required. The actual amount of waste removed, 8,341 cubic yards, was less than the anticipated volume of waste, 9,200 cubic yards.

## **VOLUME AND DESCRIPTION OF MATERIAL REMOVED**

The waste material removed consisted of a blend of chlordane and toxaphene contaminated sediment that had been stabilized with fly ash and possibly some Portland Cement. The blending was performed by US EPA in 1982.

## **FINAL LOCATION OF THE MATERIAL**

The waste material was taken to BFI - North Shelby Landfill for disposal. Attached are copies of the waste manifests for the project.

## **TOTAL ITEMIZED COST OF THE PROJECT**

Attached.

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A063060

Sample ID: #6

Date Collected: 7/30/97

Project: 97-15927

Time Collected: 6:00

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02C08

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Arsenic	<0.10	ng/L	5.0	102	8/1/97	6013A
Barium	<1.00	ng/L	100	93	8/1/97	6013A
Cadmium	<0.10	ng/L	1.0	102	8/1/97	6013A
Chromium	<0.50	ng/L	5.0	95	8/1/97	6013A
Lead	<0.50	ng/L	5.0	98	8/1/97	6013A
Mercury	<0.010	ng/L	0.20	95	8/1/97	7471
Selenium	<0.10	ng/L	1.0	114	8/1/97	6013A
Silver	<0.10	ng/L	5.0	92	8/1/97	6013A
Chlordane	<0.015	ng/L	0.030	106	8/2/97	8080
2,4-D	<5.0	ng/L	10.0	127	8/2/97	8150
Endrin	<0.0100	ng/L	0.02	127	8/2/97	8080
Heptachlor	<0.0050	ng/L	0.008	78	8/2/97	8080
Lindane	<1.00	ng/L	0.4	85	8/2/97	8080
Methoxychlor	<1.0	ng/L	10.0	96	8/2/97	8080
Toxaphene	<0.250	ng/L	0.50	98	8/2/97	8080
Silver	<0.50	ng/L	1.0	97	8/2/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	93	8/2/97	8080
TCLP Extraction:	COMPLETED				8/1/97	1311

ND = Not detected at the report limit.

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
Per-/PCB Surrogate, TOM	71.0	22. - 115.
Per-/PCB Surrogate, DEC	48.0	22. - 115.
Herbicide Sur., DOA	71.	15. - 135

AUG-03-1997 17:20

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
50 Foster Craighor Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART ELLAND  
504 INTERSTATE BLD. SOUTH  
NASHVILLE, TN 37203

Lab Number: 97-A062060

Sample ID: #6

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:30

Project Name: GULLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 / 97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 160 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A063061

Sample ID: #7

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:15

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TICP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	mg/L	5.0	102		8/1/97	6010A
Barium	<1.00	mg/L	100	93		8/1/97	6010A
Cadmium	<0.10	mg/L	1.0	102		8/1/97	6010A
Chromium	<0.50	mg/L	5.0	95		8/1/97	6010A
Lead	<0.50	mg/L	5.0	98		8/1/97	6010A
Mercury	<0.010	mg/L	0.20	92		8/1/97	7471
Selenium	<0.10	mg/L	1.0	114		8/1/97	6010A
Silver	<0.10	mg/L	5.0	70		8/1/97	6010A
Chlordane	<0.015	mg/L	0.030	87		8/2/97	8080
2,4-D	<5.0	mg/L	10.0	135		8/2/97	8150
Endrin	<0.0100	mg/L	0.02	124		8/2/97	8080
Heptachlor	<0.0050	mg/L	0.008	78		8/2/97	8080
Lindane	<0.200	mg/L	0.4	82		8/2/97	8080
Methoxychlor	<1.0	mg/L	10.0	94		8/2/97	8080
Toxaphene	<0.250	mg/L	0.50	71		8/2/97	8080
Silvex	<0.50	mg/L	1.0	144		8/2/97	8150
Heptachlor epoxide	<0.0050	mg/L	0.008	92		8/2/97	8080
TICP Extraction	COMPLETE					8/1/97	1311

ND = Not detected at the report limit.

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
Post PCB Surrogate, TOM	57.0	22. - 135.
Post PCB Surrogate, JEC	78.0	22. - 135.
Herbicide Surv., DQA	46.	15. - 135.

AUG-22-1997 17:32

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
360 Porter Craghton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART ELLIAND  
504 INTERSTATE BLVD SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-2063061

Sample ID: 87

Date Collected: 7/30/97

Project: 97-15327

Time Collected: 6:15

Project Name: GALLAGHER PTIS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 / 97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 60 Foster Creighton Drive  
 Ashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A063062

Sample ID: #3

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:30

Project Name: GALLOWAY PITS

Date Received: 7/31/97

Sampler J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	<0.10	ng/L	5.0	102		8/1/97	6010A
Barium	<1.00	ng/L	100	93		8/1/97	6010A
Calcium	<0.10	ng/L	1.0	102		8/1/97	6010A
Chromium	<0.50	ng/L	5.0	95		8/1/97	6010A
Lead	<0.50	ng/L	5.0	98		8/1/97	6010A
Mercury	<0.020	ng/L	0.20	93		8/1/97	7471
Selenium	<0.10	ng/L	1.0	114		8/1/97	6010A
Silver	<0.10	ng/L	5.0	90		8/1/97	6010A
Chloride	<0.015	ng/L	1.000	97		8/2/97	8080
2,4-D	<5.0	ng/L	10.0	100		8/2/97	8150
Endrin	<0.0100	ng/L	0.02	115		8/2/97	8080
Heptachlor	<0.0050	ng/L	0.008	82		8/2/97	8080
Lindane	<0.200	ng/L	0.4	95		8/2/97	8080
Methoxychlor	<1.0	ng/L	10.0	64		8/2/97	8080
Toxaphene	<0.250	ng/L	0.50	56		8/2/97	8080
Silver	<0.50	ng/L	1.0	137		8/2/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	30		8/2/97	8080
TCLP Extraction	COMPLETED					8/2/97	1311

ND = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Pest/FOB Surrogate, TOK	40.0	22. - 135.
Pest/FOB Surrogate, DEI	23.0	22. - 135.
Herbicide Surr., CONA	39.	15. - 135.
RJG-22-1997 17:32	Specialized Assays	

SPECIALIZED ASSAYS ENVIRONMENTAL  
70 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ACTN. STUART EILAND  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-A063060

Sample ID: #8

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 5:30

Project Name: CULLMAN PIT

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/2/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 160 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 57-A063063

Sample ID: #9

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:45

Project Name: CALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	<0.10	mg/l	5.0	102		8/1/97	6010A
Barium	<1.00	mg/l	100	93		8/1/97	6010A
Cadmium	<0.10	mg/l	1.0	102		8/1/97	6010A
Chromium	<0.50	mg/l	5.0	95		8/1/97	6010A
Lead	<0.50	mg/l	5.0	99		8/1/97	6010A
Mercury	<0.010	mg/l	0.20	93		8/1/97	7472
Selenium	<0.10	mg/l	1.0	114		8/1/97	6010A
Silver	<0.13	mg/l	5.0	92		8/1/97	6010A
Chlordane	<0.015	mg/l	0.100	70		8/2/97	8080
2,4-D	<5.0	mg/l	10.0	120		8/2/97	6150
Endrin	<0.0100	mg/l	0.02	146		8/2/97	8080
Heptachlor	<0.0050	mg/l	0.008	107		8/2/97	8080
Lindane	<0.200	mg/l	0.4	113		8/2/97	8050
Methoxychlor	<1.0	mg/l	10.0	95		8/2/97	8080
Toxaphene	<0.250	mg/l	0.50	62		8/2/97	8080
Silver	<0.50	mg/l	1.0	140		8/2/97	6150
Heptachlor epoxide	<0.0050	mg/l	0.008	120		8/2/97	8080
TCLP Extraction:	COMPLETED					8/1/97	1311

ND = Not detected at the report limit.

-- SURROGATE RECOVERIES --

Surrogate	% Recovery	Target Range
Pest / PCB Surrogate, TOM	83.0	22 - 135
Pest / PCB Surrogate, DEC	98.0	22 - 135
Pesticide Sur., DDA	38	15 - 135

AUG-02-1997 17:33

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL

ANALYTICAL REPORT

70 Foster Craighton Drive  
Nashville, Tennessee 37204

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART EILAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37203

Lab Number: 97-2063063

Sample ID: #9

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:45

Project Name: GILLHAM PETS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 5:00

State Certification: J2008

Sample Type: Solid waste

== SURROGATE RECOVERIES ==

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/2/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 ashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-AC62138

Sample ID: #1

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:00

Project Name: GALLAWAY FITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Americ	<0.10	ng/l	5.0	102	7/31/97	6010R
Barium	<1.00	ng/l	100	89	7/31/97	6010R
Cadmium	<0.10	ng/l	1.0	97	7/31/97	6010R
Chromium	<0.50	ng/l	5.0	91	7/31/97	6010R
Lead	<0.50	ng/l	5.0	94	7/31/97	6010R
Mercury	<0.010	ng/l	0.20	91	7/30/97	747
Selenium	<0.10	ng/l	1.0	111	7/31/97	6010R
Silver	<0.10	ng/l	5.0	90	7/31/97	6010R
Chlordane	<0.015	ng/l	0.130	130	8/1/97	8080
2,4-D	<5.0	ng/l	10.0	106	8/1/97	8150
Endrin	<0.0100	ng/l	0.12	130	8/1/97	8080
Heptachlor	<0.0050	ng/l	0.008	123	8/1/97	8080
Lindane	<0.200	ng/l	0.4	125	8/1/97	8080
Methoxychlor	<1.0	ng/l	10.0	154	8/1/97	8080
Toxaphene	<0.250	ng/l	0.50	135	8/1/97	8080
Silver	<0.50	ng/l	1.0	91	8/1/97	8150
Heptachlor epoxide	<0.0050	ng/l	0.008	136	8/1/97	8080
TCLP Extraction:	COMPLETED				7/30/97	1311

ND = Not detected at the report limit.

\*\* SURrogate RECOVERIES \*\*

Surrogate	% Recovery	Target Range
Post / PCB Surrogate, TOX	67.0	22 - 135
Post / PCB Surrogate, PCB	15.0	22 - 135
Herbicide Sur., DPA	56	15 - 135

AUG-01-1997 17:50

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
50 Foster-Craigton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
RTM. SUNRISE ISLAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-A06236

Sample ID: 41

Date Collected: 7/29/97

Project: 97-15027

Time Collected: 15:00

Project Name: GULLAWY FITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02006

Sample Type: Solid waste

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062139

Sample ID: #2

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:10

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 0:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	mg/l	5.0	102		7/31/97	6010A
Barium	<1.00	mg/l	100	89		7/31/97	6010A
Cadmium	<0.10	mg/l	1.0	97		7/31/97	6010A
Chromium	<0.50	mg/l	5.0	91		7/31/97	6010A
Lead	<0.50	mg/l	5.0	94		7/31/97	6010A
Mercury	<0.010	mg/l	0.20	91		7/30/97	7471
Selenium	<0.10	mg/l	1.0	111		7/31/97	6010A
Silver	<0.10	mg/l	5.0	90		7/31/97	6010A
Chlorobenzene	<0.015	mg/l	0.030	80		8/1/97	8080
2,4-D	<5.0	mg/l	10.0	84		8/1/97	6150
Endrin	<0.0100	mg/l	0.02	89		8/1/97	8080
Heptachlor	<0.0050	mg/l	0.008	97		8/1/97	8080
Lindane	<0.200	mg/l	0.4	100		8/1/97	8080
Methoxychlor	<1.0	mg/l	10.0	106		8/1/97	8080
Toxaphene	<0.250	mg/l	0.50	107		8/1/97	8080
Silvex	<0.50	mg/l	1.0	74		8/1/97	6150
Heptachlor epoxide	<0.0050	mg/l	0.008	106		8/1/97	8080
TCLP Extraction:	COMPLETED					7/30/97	1311

ND = Not detected at the report limit.

\*\*\* SURrogate RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Post / PCB Surrogate, TOX	75.0	22. - 135.
Post / PCB Surrogate, PCB	9.0	22. - 135.
Herzicide Sur., DOA	60.	25. - 135.

AUG-21-1997 17:51

Specialized Assays

P.04

SPECIALIZED ASSAYS ENVIRONMENTAL  
46 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by rail.

FOUR SEASONS 4522  
NORTH STUART BLVD  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE TN 37210

Lab Number: 97-A062139

Sample ID: #2

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:10

Project Name: GILMANBY PTIS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

== SURROGATE RECOVERIES ==

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8 / 1 /97

Theodore J. Duellie, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 660 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART ELLAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062140

Sample ID: #3

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:20

Project Name: GALLANAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	<0.10	mg/L	5.0	102		7/31/97	6010A
Barium	<1.00	mg/L	100	89		7/31/97	6010A
Cadmium	<0.10	mg/L	1.0	97		7/31/97	6010A
Chromium	<0.50	mg/L	5.0	91		7/31/97	6010A
Lead	<0.50	mg/L	5.0	94		7/31/97	6010A
Mercury	<0.010	mg/L	0.20	91		7/30/97	7471
Selenium	<0.10	mg/L	1.0	111		7/31/97	6010A
Silver	<0.10	mg/L	5.0	90		7/31/97	6010A
Chlorobenzene	<0.015	mg/L	0.030	81		8/1/97	8080
2,4-D	<5.0	mg/L	10.0	87		8/1/97	8150
Endrin	<0.0100	mg/L	0.02	91		8/1/97	8080
Heptachlor	<0.0050	mg/L	0.008	130		9/1/97	8080
Lindane	<0.200	mg/L	0.4	100		8/1/97	8080
Methoxychlor	<1.0	mg/L	10.0	110		8/1/97	8080
Toxaphene	<0.250	mg/L	0.50	109		8/1/97	8080
Silver	<0.50	mg/L	1.0	75		9/1/97	8150
Heptachlor epoxide	<0.0050	mg/L	0.008	99		9/1/97	8080
TCLP Extraction	COMPLETED					7/30/97	1311

ND = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Post / CS Surrogate, TCM	81.0	22 - 135
Post / PCB Surrogate, DEC	14.0	21 - 135
Herbicide Sur., DDA	50	15 - 135

AUG-21-1997 17:53

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
460 Foster Overton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ARTEL STUART BLVD  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-A062140

Sample ID: #3

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:20

Project Name: GILGAWAY PTES

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: C2008

Sample Type: Solid waste

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
-----	-----	-----

Report Approved By: \_\_\_\_\_

Report Date: 9/1/97

Theodore J. Duellio, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 456 Foster Craighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART SILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062141

Sample ID: #4

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	mg/L	5.0	102		7/31/97	6010A
Barium	<1.00	mg/L	100	89		7/31/97	6010A
Cadmium	<0.10	mg/L	1.0	97		7/31/97	6010A
Chromium	<0.50	mg/L	5.0	91		7/31/97	6010A
Cobalt	<0.50	mg/L	5.0	94		7/31/97	6010A
Mercury	<0.020	mg/L	0.20	91		7/30/97	7471
Selenium	<0.10	mg/L	1.0	111		7/31/97	6010A
Silver	<0.10	mg/L	5.0	90		7/31/97	6010A
Chlordane	<0.015	mg/L	0.030	66		8/1/97	8080
2,4-D	<5.0	mg/L	10.0	70		8/1/97	8150
Endrin	<0.0100	mg/L	0.02	86		8/1/97	8080
Heptachlor	<0.0050	mg/L	0.008	91		8/1/97	8080
Lindane	<0.200	mg/L	0.4	94		8/1/97	8080
Methoxychlor	<1.0	mg/L	10.0	124		8/1/97	8080
Toxaphene	<0.250	mg/L	0.50	103		8/1/97	8080
Silvex	<0.50	mg/L	1.0	78		8/1/97	8150
Heptachlor epoxide	<0.0050	mg/L	0.008	99		8/1/97	8080
TCLP Extraction	COMPLETE					7/30/97	1311

NO = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Post/PCB Surrogate, TOX	71.0	22. - 135.
Post/PCB Surrogate, DEH	7.0	22. - 135.
Herbicide Sur., DDA	112.	15. - 135.

RJG-21-1997 17:55

Specialized Assays

P. 08

SPECIALIZED ASSAYS ENVIRONMENTAL  
60 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4822  
ATTN: SILVIA HILAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-A062-41

Sample ID: M4

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GALLAWAY FITS

Date Received: 7/29/97

Sampler: J. JOE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

→ SURROGATE RECOVERIES →

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART HILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062142

Sample ID: #5

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:40

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	ng/L	5.0	102		7/31/97	601CA
Barium	<1.00	ng/L	100	99		7/31/97	601CA
Cadmium	<0.10	ng/L	1.0	97		7/31/97	601CA
Chromium	<0.50	ng/L	5.0	91		7/31/97	601CA
Lead	<0.50	ng/L	5.0	94		7/31/97	601CA
Mercury	<0.010	ng/L	0.20	91		7/30/97	747L
Selenium	<0.10	ng/L	1.0	111		7/31/97	601CA
Silver	<0.10	ng/L	5.0	90		7/31/97	601CA
Chlordane	<0.015	ng/L	0.030	64		8/1/97	808C
2,4-D	<5.0	ng/L	10.0	119		8/1/97	815C
Endrin	<0.0100	ng/L	0.02	101		8/1/97	808C
Heptachlor	<0.0050	ng/L	0.008	91		8/1/97	808C
Lindane	<0.200	ng/L	0.4	101		8/1/97	808C
Methoxychlor	<1.0	ng/L	10.0	143		8/1/97	808C
Toxaphene	<0.250	ng/L	0.50	109		8/1/97	808C
Silvex	<0.50	ng/L	1.0	70		8/1/97	815C
Heptachlor epoxide	<0.0050	ng/L	0.008	125		8/1/97	808C
TCLP Extraction	COMPLETED					7/30/97	131L

NC = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Post/PCB Surrogate, TOK	91.0	22. - 135.
Post/PCB Surrogate, DBC	8.0	22. - 135.
Neutralside Sur., OCA	89.	15. - 135.
PLG-21-1997 17:56	Specialized Assays	

SPECIALIZED ASSAYS ENVIRONMENTAL

ANALYTICAL REPORT

Postar Craighton Drive  
Nashville, Tennessee 37204

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART EILAND  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-2062142

Sample ID: #5

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:40

Project Name: GULLAWAY FITE

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

-- SURROGATE RECOVERIES --

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

**APPENDIX E**

**Remedial Action Report – August 22, 1997**

DIVISION OF  
SUPERFUND

1997 OCT -8 PM 2:05

TENNESSEE DEPARTMENT  
OF ENVIRONMENTAL  
CONSERVATION

**REMEDIAL ACTION REPORT**  
**FOR**  
**GALLAWAY PITS**  
**GALLAWAY, FAYETTE COUNTY**  
**TDSF SITE NUMBER 24-503**

**AUGUST 22, 1997**

Prepared by

**TENNESSEE DIVISION OF SUPERFUND**  
**Nashville Environmental Field Office**  
**537 Brick Church Park Drive**  
**Nashville, Tennessee 37207**



STATE OF TENNESSEE  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Division of Superfund  
4<sup>th</sup> Floor, L&C Annex  
401 Church Street  
Nashville, TN 37243-1538

13 March, 2000

Mr. Robert West  
U.S. Environmental Protection Agency  
Waste Management Division  
Atlanta Federal Center  
61 Forsyth Street, SW  
Atlanta, GA 30303

RE: Gallaway Pits, Gallaway, Fayette County, Tennessee  
EPA Site #TND9807.28992 TDSF Site # 24-503

Subject: Recommendation for Archival

Dear Mr. West:

The Tennessee Division of Superfund (TDSF) hereby transmits a copy of the Remedial Action Report for the Gallaway Pits site. TDSF recommends that this site be considered for archival from the CERCLIS listing, since no contamination remains on site.

If you have any questions, call me at (615) 532-0984 or e-mail me at [tstewart2@mail.state.tn.us](mailto:tstewart2@mail.state.tn.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Tim Stewart".

Tim Stewart  
Voluntary Cleanup, Oversight, and Assistance Program  
Division of Superfund

XC: TDSF Central Office and EAC - Memphis File

## **DESCRIPTION OF WORK PERFORMED**

The remedial action performed in July, 1997 consisted of the removal of the landfill cap; the excavation, transportation and off-site disposal of the waste material, the re-grading of the pit, and the abandonment of the eight monitoring wells.

The cap consisted of four (4) inches of river gravel, a geotextile fabric, two (2) feet of soil, a geotextile fabric, three (3) feet of soil, one (1) foot of sand, a geomembrane, three (3) feet of clay, and six (6) inches of sand. The gas vent outlet pipes on top of the cap extended only through the first geotextile layer and was not connected to any additional piping. The gas collection piping in the top layer of sand was left over well screen and was not connected together in any fashion. One sample was taken at the request of the Tennessee Division of Solid Waste Management prior to the issuance of the Special Waste permit.

After removal of the cap, 12,074 tons of waste were removed and sent to the BFI - North Shelby Landfill for disposal. Once all waste was removed, nine confirmatory samples were taken from the pit bottom and were below detection levels. Once the sample results were received, the north and south sides of the pit were sloped and the bottom was leveled off. A trench was cut in the southeastern corner of the pit to aid in stormwater removal. All re-grading work was performed as per the wishes of the property owner who expects to mine gravel and sand from the pit and pit area.

The monitoring wells were filled with a bentonite - cement grout slurry utilizing a grout plant and tremie pipe. Once the slurry set-up, the well casings were removed to at least thirty (30) inches below ground surface. The disturbed area around the church well was seeded with fescue.

Nine confirmatory samples were taken from the pit bottom and run for TCLP pesticides/herbicides. The samples were taken on a grid system and showed concentrations below the detectable limits.

No variations from the Request for Bids information was required. The actual amount of waste removed, 8,341 cubic yards, was less than the anticipated volume of waste, 9,200 cubic yards.

## **VOLUME AND DESCRIPTION OF MATERIAL REMOVED**

The waste material removed consisted of a blend of chlordane and toxaphene contaminated sediment that had been stabilized with fly ash and possibly some Portland Cement. The blending was performed by US EPA in 1982.

## **FINAL LOCATION OF THE MATERIAL**

The waste material was taken to BFI - North Shelby Landfill for disposal. Attached are copies of the waste manifests for the project.

## **TOTAL ITEMIZED COST OF THE PROJECT**

Attached.

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lak Number: 97-A063060

Sample ID: #6

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:00

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02C08

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	ng/L	5.0	102		8/1/97	6013A
Barium	<1.00	ng/L	100	23		8/1/97	6013A
Cadmium	<0.10	ng/L	1.0	102		8/1/97	6013A
Chromium	<0.50	ng/L	5.0	95		8/1/97	6013A
Lead	<0.50	ng/L	5.0	96		8/1/97	6013A
Mercury	<0.010	ng/L	0.20	93		8/1/97	7471
Selenium	<0.10	ng/L	1.0	114		8/1/97	6013A
Silver	<0.10	ng/L	5.0	92		8/1/97	6013A
Chloroform	<0.015	ng/L	0.030	106		8/2/97	8080
2,4-D	<5.0	ng/L	10.0	127		8/2/97	8150
Endrin	<0.0100	ng/L	0.02	127		8/2/97	8080
Heptachlor	<0.0050	ng/L	0.008	78		8/2/97	8080
Lindane	<0.200	ng/L	0.4	85		8/2/97	8080
Methoxychlor	<1.0	ng/L	10.0	96		8/2/97	8080
Toxaphene	<0.250	ng/L	0.50	98		8/2/97	8080
Silvex	<0.50	ng/L	1.0	97		8/2/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	93		8/2/97	8080
TCLP Extraction	COMPLETED					8/1/97	1311

ND - Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Part / PCB Surrogate, TOM	71.0	22 - 115
Part / PCB Surrogate, DEC	48.0	22 - 115
Heptachlor Surrogate, DDM	71	15 - 125

AUG-02-1997 17:20

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
50 Foster-Craigtor Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
JIMM. STUART ISLAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37203

Lab Number: 97-AD6206C

Sample ID: #E

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:00

Project Name: GILGAWRY PITTS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
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Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 / 97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 160 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A063061

Sample ID: #7

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:15

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 2:00

State Certification: 02008

Sample Type: Solid waste

TLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Method
				Recovery (%)	Date	
Arsenic	<0.10	mg/l	5.0	102	8/1/97	6010A
Barium	<1.00	mg/l	100	93	8/1/97	6010A
Cadmium	<0.10	mg/l	1.0	102	8/1/97	6010A
Chromium	<0.50	mg/l	5.0	96	8/1/97	6010A
Lead	<0.50	mg/l	5.0	98	8/1/97	6010A
Mercury	<0.010	mg/l	0.20	99	8/1/97	7471
Selenium	<0.10	mg/l	1.0	114	8/1/97	6010A
Silver	<0.10	mg/l	5.0	90	8/1/97	6010A
Chlordane	<0.015	mg/l	0.010	87	8/2/97	8080
2,4-D	<5.0	mg/l	10.0	135	8/2/97	8150
Endrin	<0.0100	mg/l	0.01	124	8/2/97	8080
Heptachlor	<0.0050	mg/l	0.005	78	8/2/97	8080
Lindane	<0.200	mg/l	0.4	82	8/2/97	8080
Methoxychlor	<1.0	mg/l	10.0	94	8/2/97	8080
Toxaphene	<0.250	mg/l	0.50	71	8/2/97	8080
Sliver	<0.50	mg/l	1.0	144	8/2/97	8150
Heptachlor epoxide	<0.0050	mg/l	0.005	92	8/2/97	8080
TLP Extraction	COMPLETED				8/1/97	1311

ND = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Rest/PCB Surrogate, TOMK	57.0	22. - 135.
Rest/PCB Surrogate, JEC	78.0	22. - 135.
Heptachlor Sur., JORA	46.	15. - 135.

AUG-02-1997 17:32

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL

ANALYTICAL REPORT

360 Foster Creighton Drive  
Nashville, Tennessee 37204

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522

ATTN: STUART ELAND

504 INTERSTATE BLVD SOUTH  
NASHVILLE, TN 37210

Lot Number: 97-2063061

Sample ID: 87

Date Collected: 7/30/97

Project: 97-15327

Time Collected: 6:15

Project Name: GALLERY FITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

== SURROGATE RECOVERIES ==

Surrogate	% Recovery	Target Range
-----	-----	-----

Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 /97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 60 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A061062

Sample ID: #3

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:30

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Arsenic	<0.10	ng/L	5.0	102	8/1/97	6010A
Barium	<1.00	ng/L	100	93	8/1/97	6010A
Cadmium	<0.10	ng/L	1.0	102	8/1/97	6010A
Chromium	<0.50	ng/L	5.0	95	8/1/97	6010A
Lead	<0.50	ng/L	5.0	98	8/1/97	6010A
Mercury	<0.010	ng/L	0.20	23	8/1/97	7471
Selenium	<0.10	ng/L	1.0	114	8/1/97	6010A
Silver	<0.10	ng/L	5.0	92	8/1/97	6010A
Chloride	<0.015	ng/L	0.030	87	8/2/97	8080
2,4-D	<5.0	ng/L	10.0	120	8/2/97	8150
Endrin	<0.0100	ng/L	0.02	115	8/2/97	8080
Heptachlor	<0.0050	ng/L	0.008	82	8/2/97	8080
Lindane	<0.200	ng/L	0.4	85	8/2/97	8080
Methoxychlor	<1.0	ng/L	10.0	64	8/2/97	8080
Toxaphene	<0.250	ng/L	0.50	56	8/2/97	8080
Silver	<0.50	ng/L	1.0	137	8/2/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	90	8/2/97	8080
TCLP Extraction	COMPLETED				8/1/97	1311

ND = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Pest/OCB Surrogate, TOMK	40.0	22. - 135.
Pest/OCB Surrogate, DEK	23.0	22. - 135.
Herbicide Sur., DDA	39.	15. - 135.
AUF-82-1097 17:32	Specialized Assays	

SPECIALIZED ASSAYS ENVIRONMENTAL  
70 Foster Creighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ACTN. STUART ELLARD  
504 INTERSTATE BLAC. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-AD3062

Sample ID: #8

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:30

Project Name: CULLWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
-----	-----	-----

Report Approved By: \_\_\_\_\_

Report Date: 8/2/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 160 Foster Creighton Drive  
 Ashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37216

Lab Number: 97-A061063

Sample ID: #9

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:45

Project Name: GALLOWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Arsenic	<0.10	mg/l	5.0	132	8/1/97	6010A
Barium	<1.00	mg/l	100	93	8/1/97	6010A
Cadmium	<0.10	mg/l	1.0	132	8/1/97	6010A
Chromium	<0.50	mg/l	5.0	95	8/1/97	6010A
Lead	<0.50	mg/l	5.0	99	8/1/97	6010A
Mercury	<0.010	mg/l	0.20	93	8/1/97	747
Selenium	<0.10	mg/l	1.0	114	8/1/97	6010A
Silver	<0.10	mg/l	5.0	92	8/1/97	6010A
Chlordane	<0.015	mg/l	0.100	70	8/2/97	8080
2,4-D	<5.0	mg/l	10.0	120	8/2/97	6150
Endrin	<0.0100	mg/l	0.22	146	8/2/97	8080
Heptachlor	<0.0050	mg/l	0.008	107	8/2/97	8080
Lindane	<0.200	mg/l	0.4	113	8/2/97	8080
Methoxychlor	<1.0	mg/l	10.0	95	8/2/97	8080
Toxaphene	<0.250	mg/l	0.50	81	8/2/97	8080
Silvex	<0.50	mg/l	1.0	140	8/2/97	6150
Heptachlor epoxide	<0.0050	mg/l	0.008	120	8/2/97	8080
TCLP Extraction:	COMPLETED				8/1/97	1311

ND = Not detected at the report limit.

-- SURROGATE RECOVERIES --

Surrogate	% Recovery	Target Range
Fast PCB Surrogate, TOM	83.0	22 - 135
Fast PCB Surrogate, DEC	99.0	22 - 135
Herbicide Sur., DCA	38	15 - 135

AUG-02-1997 17:33

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
70 Foster Craighton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEAS/INS 4522  
ATTN: SILVIA EILAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37203

Lab Number: 97-2663063

Sample ID: #9

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:45

Project Name: GULLWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: J2008

Sample Type: Solid waste

== SURFACE RECOVERIES ==

Substrate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 8 / 2 / 97

Theodore J. Dusillo, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 360 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062138

Sample ID: #1

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:00

Project Name: GALLAWAY FITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Arsenic	<0.10	ng/L	5.0	132	7/31/97	6010A
Barium	<1.00	ng/L	100	89	7/31/97	6010A
Cadmium	<0.10	ng/L	1.0	97	7/31/97	6010A
Chromium	<0.50	ng/L	5.0	91	7/31/97	6010A
Lead	<0.50	ng/L	5.0	94	7/31/97	6010A
Mercury	<0.010	ng/L	0.20	91	7/30/97	747L
Selenium	<0.10	ng/L	1.0	111	7/31/97	6010A
Silver	<0.10	ng/L	5.0	90	7/31/97	6010A
Chloride	<0.015	ng/L	0.100	130	8/1/97	8080
2,4-D	<5.0	ng/L	10.0	106	8/1/97	6150
Endrin	<0.0100	ng/L	0.12	130	8/1/97	8080
Heptachlor	<0.0050	ng/L	0.008	123	8/1/97	8080
Lindane	<0.200	ng/L	0.4	125	8/1/97	8080
Methoxychlor	<1.0	ng/L	10.0	154	8/1/97	8080
Toxaphene	<0.250	ng/L	0.50	135	8/1/97	8080
Silvex	<0.50	ng/L	1.0	91	8/1/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	136	8/1/97	8080
TCLP Detection:	COMPLETED				7/30/97	1311

ND = Not detected at the report limit.

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
Rest/PCB Surrogate, TOX	67.0	22 - 135
Rest/PCB Surrogate, DEK	15.0	22 - 135
Herbicide Sur., DDA	56	15 - 135

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
60 Foster-Craigton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
RTM. STURGE ISLAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-A062L38

Sample ID: M1

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:00

Project Name: GALLAWAY FITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
-----	-----	-----

Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Dusello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Darryl B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

• Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART BILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062119

Sample ID: #2

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:10

Project Name: GALLAWAY PITS

Date Received: 7/29/97

Sampler: J. COBE

Time Received: 3:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	ng/l	5.0	102		7/31/97	6010A
Barium	<1.00	ng/l	100	89		7/31/97	6010A
Cadmium	<0.10	ng/l	1.0	97		7/31/97	6010A
Chromium	<0.50	ng/l	5.0	91		7/31/97	6010A
Lead	<0.50	ng/l	5.0	94		7/31/97	6010A
Mercury	<0.010	ng/l	0.20	91		7/30/97	7471
Selenium	<0.10	ng/l	1.0	111		7/31/97	6010A
Silver	<0.10	ng/l	5.0	90		7/31/97	6010A
Chlordane	<0.015	ng/l	0.030	80		8/1/97	8080
2,4-D	<5.0	ng/l	10.0	84		8/1/97	8150
Aldrin	<0.0100	ng/l	0.02	89		8/1/97	8080
Heptachlor	<0.0050	ng/l	0.008	97		8/1/97	8080
Lindane	<0.200	ng/l	0.4	100		8/1/97	8080
Methoxychlor	<1.0	ng/l	10.0	106		8/1/97	8080
Toxaphene	<0.250	ng/l	0.50	107		8/1/97	8080
Silver	<0.50	ng/l	1.0	74		8/1/97	8150
Heptachlor epoxide	<0.0050	ng/l	0.008	106		8/1/97	8080
TCLP Extraction	COMPLETED					7/29/97	1311

ND = Not detected at the report limit.

\*\* SURrogate RECOVERIES \*\*

Surrogate	% Recovery	Target Range
Post / PCB Surrogate, TOX	75.0	22. - 135.
Post / PCB Surrogate, DEC	9.0	22. - 135.
Herbicide Sur., DDA	60.	25. - 135.

SPECIALIZED ASSAYS ENVIRONMENTAL  
460 Foster-Craigton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ACTIN. STUNT BILARD  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE TN 37210

Lab Number: 97-1062139

Sample ID: #2

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:10

Project Name: GILGAWAY PETS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
.....	.....	.....

Report Approved By: \_\_\_\_\_

Report Date: 9 / 1 /97

Theodore J. Duellio, Ph.D., Q.A. Officer  
Michael H. Gunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 760 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART ELLAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062140

Sample ID: #3

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:20

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery (%)			
Arsenic	<0.10	mg/L	5.0	102		7/31/97	6010A
Barium	<1.00	mg/L	100	89		7/31/97	6010A
Cadmium	<0.10	mg/L	1.0	97		7/31/97	6010A
Chromium	<0.50	mg/L	5.0	91		7/31/97	6010A
Lead	<0.50	mg/L	5.0	94		7/31/97	6010A
Mercury	<0.010	mg/L	0.20	91		7/30/97	7471
Selenium	<0.10	mg/L	1.0	111		7/31/97	6010A
Silver	<0.10	mg/L	5.0	90		7/31/97	6010A
Chlordane	<0.015	mg/L	0.030	81		8/1/97	8080
2,4-D	<5.0	mg/L	10.0	87		8/1/97	8150
Atrazin	<0.0100	mg/L	0.02	92		8/1/97	8080
Heptachlor	<0.0050	mg/L	0.008	100		8/1/97	8080
Lindane	<0.200	mg/L	0.4	100		8/1/97	8080
Methoxychlor	<1.0	mg/L	10.0	130		8/1/97	8080
Toxaphene	<0.250	mg/L	0.50	109		8/1/97	8080
Silver	<0.50	mg/L	1.0	75		8/1/97	8150
Heptachlor epoxide	<0.0050	mg/L	0.008	99		8/1/97	8080
TCLP Extraction	COMPLETED					7/30/97	1311

ND = Not detected at the report limit.

== SURROGATE RECOVERIES ==

Surrogate	% Recovery	Target Range
Post PCB Surrogate, TOX	81.0	21 - 135
Post PCB Surrogate, DEC	14.0	21 - 135
Herbicide Sur., DCA	50	15 - 135

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Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
460 Foster Crichton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART EILAND  
504 INDEPENDENCE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 77-20521-40

Sample ID: #3

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GILKIN PTES

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: C2008

Sample Type: Solid waste

--- SURROGATE RECOVERIES ---

Surrogate	% Recovery	Target Range
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Report Approved By: \_\_\_\_\_

Report Date: 9/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Craighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART EILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062141

Sample ID: #4

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GALLOWAY PITS

Date Received: 7/29/97

Sampler: C. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		
				Recovery (%)	Date	Method
Arsenic	<0.10	mg/L	5.0	102	7/31/97	6010A
Barium	<1.00	mg/L	100	89	7/31/97	6010A
Cadmium	<0.10	mg/L	1.0	97	7/31/97	6010A
Chromium	<0.50	mg/L	5.0	91	7/31/97	6010A
Lead	<0.50	mg/L	5.0	94	7/31/97	6010A
Mercury	<0.010	mg/L	0.20	91	7/30/97	7471
Selenium	<0.10	mg/L	1.0	111	7/31/97	6010A
Silver	<0.10	mg/L	5.0	90	7/31/97	6010A
Chlordane	<0.015	mg/L	0.030	66	8/1/97	8080
2,4-D	<5.0	mg/L	10.0	70	8/1/97	8150
Endrin	<0.0100	mg/L	0.02	86	8/1/97	8080
Heptachlor	<0.0050	mg/L	0.008	91	8/1/97	8080
Lindane	<0.300	mg/L	0.4	94	8/1/97	8080
Methoxychlor	<1.0	mg/L	10.0	124	8/1/97	8080
Toxaphene	<0.250	mg/L	0.50	103	8/1/97	8080
Silvex	<0.50	mg/L	1.0	75	8/1/97	8150
Heptachlor epoxide	<0.0050	mg/L	0.008	99	8/1/97	8080
TCLP Extraction	COMPLETED				7/30/97	1311

ND = Not detected at the report limit.

\*\*\* SURROGATE RECOVERIES \*\*\*

Surrogate	% Recovery	Target Range
Post/PCB Surrogate, TOX.	71.0	22. - 135.
Post/PCB Surrogate, DEC	7.0	22. - 135.
Heptachlor Surr., DDA	112.	15. - 135.

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL  
60 Foster Craghton Drive  
Nashville, Tennessee 37204

ANALYTICAL REPORT

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4822  
ATTN: STUART HILAND  
504 INTERSTATE BLVD. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-A0621-1

Sample ID: #4

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:30

Project Name: GALLAWAY FTIS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

↔ SURROGATE RECOVERIES ↔

Surrogate	% Recovery	Target Range
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Report Approved By: \_\_\_\_\_

Report Date: 8 / 1 /97

Theodore J. Duellio, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Craighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN: STUART HILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A062142

Sample ID: #5

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:40

Project Name: GALLAWAY PITS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02908

Sample Type: Solid waste

TLP Results

Analyte	Result	Units	Reg Limit	Matrix Spike		Date	Method
				Recovery %			
Arsenic	<0.10	ng/L	5.0	102		7/31/97	601CA
Barium	<1.00	ng/L	100	99		7/31/97	601CA
Cadmium	<0.10	ng/L	1.0	37		7/31/97	601CA
Chromium	<0.50	ng/L	5.0	21		7/31/97	601CA
Lead	<0.50	ng/L	5.0	34		7/31/97	601CA
Mercury	<0.010	ng/L	0.20	21		7/30/97	747L
Selenium	<0.10	ng/L	1.0	111		7/31/97	601CA
Silver	<0.10	ng/L	5.0	30		7/31/97	601CA
Chlordane	<0.015	ng/L	0.030	64		8/1/97	808C
2,4-D	<5.0	ng/L	10.0	119		8/1/97	815C
Endrin	<0.0100	ng/L	0.02	101		8/1/97	808C
Heptachlor	<0.0050	ng/L	0.008	21		8/1/97	808C
Lindane	<0.200	ng/L	0.4	101		8/1/97	808C
Methoxychlor	<1.0	ng/L	10.0	143		8/1/97	808C
Toxaphene	<0.250	ng/L	0.50	109		8/1/97	808C
Silver	<0.50	ng/L	1.0	70		8/1/97	815C
Heptachlor epoxide	<0.0050	ng/L	0.008	125		8/1/97	808C
TLP Extraction	COMPLETED					7/30/97	1311

NC = Not detected at the report limit.

\*\* SURROGATE RECOVERIES \*\*

Surrogate	% Recovery	Target Range
Pest/PCB Surrogate, TOM	92.0	22. - 135.
Pest/PCB Surrogate, DEB	8.0	22. - 135.
Herbicide Sur., DONA	89.	15. - 135.

AUG-21-1997 17:56

Specialized Assays

SPECIALIZED ASSAYS ENVIRONMENTAL

ANALYTICAL REPORT

71 Foster Craighton Drive  
Nashville, Tennessee 37204

Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
ATTN: STUART ELLAND  
504 INTERSTATE BLDG. SOUTH  
NASHVILLE, TN 37210

Lab Number: 97-2062142

Sample ID: #5

Date Collected: 7/28/97

Project: 97-15027

Time Collected: 15:40

Project Name: GILLOWAY FETS

Date Received: 7/29/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

← SURROGATE RECOVERIES →

Surrogate	% Recovery	Target Range
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Report Approved By: \_\_\_\_\_

Report Date: 8/1/97

Theodore J. Duello, Ph.D., Q.A. Officer  
Michael H. Dunn, M.S., Technical Director  
Danny B. Hale, M.S., Laboratory Director

## **DESCRIPTION OF WORK PERFORMED**

The remedial action performed in July, 1997 consisted of the removal of the landfill cap; the excavation, transportation and off-site disposal of the waste material, the re-grading of the pit, and the abandonment of the eight monitoring wells.

The cap consisted of four (4) inches of river gravel, a geotextile fabric, two (2) feet of soil, a geotextile fabric, three (3) feet of soil, one (1) foot of sand, a geomembrane, three (3) feet of clay, and six (6) inches of sand. The gas vent outlet pipes on top of the cap extended only through the first geotextile layer and was not connected to any additional piping. The gas collection piping in the top layer of sand was left over well screen and was not connected together in any fashion. One sample was taken at the request of the Tennessee Division of Solid Waste Management prior to the issuance of the Special Waste permit.

After removal of the cap, 12,074 tons of waste were removed and sent to the BFI - North Shelby Landfill for disposal. Once all waste was removed, nine confirmatory samples were taken from the pit bottom and were below detection levels. Once the sample results were received, the north and south sides of the pit were sloped and the bottom was leveled off. A trench was cut in the southeastern corner of the pit to aid in stormwater removal. All re-grading work was performed as per the wishes of the property owner who expects to mine gravel and sand from the pit and pit area.

The monitoring wells were filled with a bentonite - cement grout slurry utilizing a grout plant and tremie pipe. Once the slurry set-up, the well casings were removed to at least thirty (30) inches below ground surface. The disturbed area around the church well was seeded with fescue.

Nine confirmatory samples were taken from the pit bottom and run for TCLP pesticides/herbicides. The samples were taken on a grid system and showed concentrations below the detectable limits.

No variations from the Request for Bids information was required. The actual amount of waste removed, 8,341 cubic yards, was less than the anticipated volume of waste, 9,200 cubic yards.

## **VOLUME AND DESCRIPTION OF MATERIAL REMOVED**

The waste material removed consisted of a blend of chlordane and toxaphene contaminated sediment that had been stabilized with fly ash and possibly some Portland Cement. The blending was performed by US EPA in 1982.

## **FINAL LOCATION OF THE MATERIAL**

The waste material was taken to BFI - North Shelby Landfill for disposal. Attached are copies of the waste manifests for the project.

## **TOTAL ITEMIZED COST OF THE PROJECT**

Attached.

SPECIALIZED ASSAYS ENVIRONMENTAL  
 960 Foster Creighton Drive  
 Nashville, Tennessee 37204

ANALYTICAL REPORT

\* Original report and a copy of the chain of custody will follow by mail.

FOUR SEASONS 4522  
 ATTN. STUART BILAND  
 504 INTERSTATE BLVD. SOUTH  
 NASHVILLE, TN 37210

Lab Number: 97-A063060

Sample ID: #6

Date Collected: 7/30/97

Project: 97-15027

Time Collected: 6:00

Project Name: GALLAWAY PITS

Date Received: 7/31/97

Sampler: J. JOBE

Time Received: 9:00

State Certification: 02008

Sample Type: Solid waste

TCLP Results

Analyte	Result	Units	Matrix Spike		Date	Method
			Reg Limit	Recovery (%)		
Arsenic	<0.10	ng/L	5.0	102	8/1/97	6010A
Barium	<1.00	ng/L	100	23	8/1/97	6010A
Cadmium	<0.10	ng/L	1.0	102	8/1/97	6010A
Chromium	<0.50	ng/L	5.0	95	8/1/97	6010A
Lead	<0.50	ng/L	5.0	96	8/1/97	6010A
Mercury	<0.010	ng/L	0.20	55	8/1/97	7471
Selenium	<0.10	ng/L	1.0	114	8/1/97	6010A
Silver	<0.10	ng/L	5.0	92	8/1/97	6010A
Chlordane	<0.015	ng/L	0.030	106	8/2/97	8080
2,4-D	<5.0	ng/L	10.0	127	8/2/97	8150
Endrin	<0.000	ng/L	0.02	127	8/2/97	8080
Heptachlor	<0.0050	ng/L	0.008	78	8/2/97	8080
Lindane	<0.250	ng/L	0.4	85	8/2/97	8080
Methoxychlor	<1.0	ng/L	10.0	96	8/2/97	8080
Toxaphene	<0.250	ng/L	0.50	98	8/2/97	8080
Silver	<0.50	ng/L	1.0	97	8/2/97	8150
Heptachlor epoxide	<0.0050	ng/L	0.008	93	8/2/97	8080
TCLP Extraction	COMPLETED				8/1/97	8171

ND = Not detected at the report limit.

== SURROGATE RECOVERIES ==

Surrogate	% Recovery	Target Range
Pest/CS Surrogate, TOX	71.0	22. - 145.
Pest/CS Surrogate, DEC	98.0	22. - 135.
Herbicide Sur., DDA	71.	15. - 135

AUG-27-1997 17:20

Specialized Assays

P 02

**APPENDIX F**  
**Responsiveness Summary**

## APPENDIX F

### RESPONSIVENESS SUMMARY

The responsiveness summary addresses public comments on the proposed plan that identified a fundamental change in the original remedy Implemented at the Gallaway Pits Site. The Proposed Plan was issued on April 16, 2014. The public comment period was held from April 16, 2014 to May 27, 2014. The Proposed Plan and supporting documents were presented in the Administrative Record and made available at the public information repository located at the Sam T. Wilson Public Library, 11968 Walker Street Arlington, Tennessee. Outlined below is a summary of the comments received from the public. Copies of the full comments will be available for review in the information repository.

#### SUMMARISED COMMUNITY CONCERNS

**Comment # 1:** *There should be no discontinuing of continual checks on the gravel pits for the safety in our community. We are aware of some of the problems in the past and are concerned for our safety as well as other residents in the community. We feel that you find this very necessary for one reason, that we are told of toxic material being dumped not long ago near HWY 70 and Poplar Springs. We are aware that there was an initial step implemented that removed such. This is our plea, as new residents to the community, that the EPA continue to monitor these problem sites, at least on a five year basis, as has been the prior timeline for the continued safety of the tax-paying citizens in this community. We appreciate your giving us a chance to respond and sincerely hope and pray that our plea is not only heard but adhered to by EPA to keep the residents safe.*

**Comment # 2:** *Great appreciation and respect goes out to those who were interested in the potential danger of such contaminants to surrounding residents of the mentioned gravel pits and ponds. According to the literature, the venture was successful in obtaining a safe remedy to a very serious problem. We were told of toxic material being dumped not long ago near Hwy 70 and Poplar Springs. Our concerns, we feel, are very valid; and as law abiding, tax paying citizens, would encourage the EPA continue to monitor these areas with prior problems every so many years as a safety feature for all the residents in the area.*

**EPA Response:** Due to the removal of the cap and all solidified material, the site in its current condition does not present a risk to human health or the environment. No future action under CERCLA is warranted. The Removal Action implemented by the Tennessee Department of Environment and Conservation (TDEC) in 1997 consisted of the following:

- Removal of the fence and RCRA cap.
- Excavation of the consolidated soils and sediments lying beneath the cap.
- Disposal of approximately 12 tons of contaminated soils and sediments at the BFI-North Shelby Landfill, a RCRA Subtitle D landfill.
- Confirmatory sampling of the soils remaining in the bottom and sides of the excavation, analyzing the samples for TCLP pesticides/herbicides.
- All samples were below detection limits.
- Closure and abandonment of the groundwater monitoring wells.
- Regrading and seeding the site.

Since there are no remaining risk to human health and the environment. EPA has completed it's statutory requirements to cleanup the site under Superfund. There are no further CERCLA requirements for conducting Five-Year Reviews or any other monitoring program. If, in the future, there are instances of illegal dumping, residents should contact the city or county government to report these events.